THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

TRANSWESTERN PIPELINE COMPANY, a Delaware corporation, Plaintiff(s), v. MONSANTO COMPANY, a Delaware corporation, etc. Defendant(s).	)	No. BC026959

DEPOSITION OF GEORGE BUCHANAN

October 16, 1992

Tucson, Arizona

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APPEARANCES:

SHEARMAN & STERLING
By Ms. Janet M. Grady
Attorneys for the Plaintiff

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By Mr. Donald F. Zimmer, Jr.
Attorneys for the Defendant

BE IT REMEMBERED that pursuant to notice for taking depositions in the above styled and numbered cause, the deposition of GEORGE BUCHANAN was taken upon oral examination at the law offices of Brown & Bain, One South Church Avenue, Suite 530, in the City of Tucson, County of Pima, State of Arizona, before Barbara Brodrick, a Notary Public in and for the State of Arizona, on October 16, 1992, commencing at the hour of 9:00 a.m. on said day, in a certain cause now pending before the Superior Court of Los Angeles County, California.

GEORGE BUCHANAN,

having first been duly sworn to tell the truth, the whole truth, and nothing but the truth, testified as follows:

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EXAMINATION

BY MS. GRADY:

Q My name is Janet Grady and I'm with the law firm of Shearman & Sterling. We represent Transwestern Pipeline Company in this litigation against Monsanto Company.

Could you please state your name and spell your name for the record?

A George R. Buchanan, B-u-c-h-a-n-a-n.

Q And could you also state your address for the record?

A 2751 Camino Ortega. Green Valley, Arizona. 85614.

Q Mr. Buchanan, have you ever had your deposition taken before?

A Never have before.

Q Let me go over the ground rules then so we're operating off of the same page. You understand that you're under oath today?

A Yes.

Q And you understand that even though we're in an informal setting in a conference room, it's just as if you were testifying in a court of law?

A I understand. Yes.

Q It's important that we get your best

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testimony here today, so if you don't understand a question or you think that you may not have understood one of my questions, would you let me know?

A All right.

Q So that we can get a clear record and we don't drive our reporter crazy, it's important that I wait until you finish your answers and if you would wait until I finish my questions it would be most appreciated.

A All right.

Q Could you summarize for me your educational history after high school?

A I graduated from the University of Texas in 1939 with a B.S. in chemical engineering. I started in graduate school for about nine months and then I left and went to work.

Q And in what subject were you pursuing graduate studies?

A Chemical engineering.

Q Did you ever obtain an M.A.?

A No.

Q Where did you take your first position?

A My first job was chief chemist in the Lone Star Brewing Company in San Antonio, Texas.

Q That's a great job. And when was that?

A That was in the spring of 1940. Something

like that. Late spring, early summer.

Q Just because I'm interested, what were your job responsibilities in that job?

A Testing beer, treating water, I guess miscellaneous testing of that type. It was a fairly straightforward job.

Q When did you go to work for Monsanto?

A I went to work for Monsanto in December 1945. I can remember that pretty good because I'd just come out of the military in St. Louis.

Q Did you work for Monsanto until you retired?

A No, I left Monsanto in 1969 and became president of a subsidiary of the Burma Oil Company in London, England, called Edwin Cooper, Incorporated.

Q What I would like to do is to go over your employment history at Monsanto. If you could give me basically a chronology of the positions you held between 1945 and 1969 with just a brief discretion.

A The year will be best memory. I started in '45 in the research department in what they call application research in the plasticizers. I was there about, my guess is two to two and a half, three years. Something like that.

Then I was transferred to the development department to do technical service on plasticizers. I was

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in development for two years or three years at the most, something like that, when they transferred this function to the marketing department and so I moved to the marketing department sometime around 1950, '51 to do the same job basically.

In 1953 -- which is an accurate year because I remember I took a long trip to Japan and I couldn't forget that -- I was transferred back to the development department as development manager for plasticizers. They call the group plasticizers, resins and functional fluids.

Then about '56, '57 -- I can't tell you exactly -- I went back to the marketing department as an associate product manager for oil additives and functional fluids. Two or three years later I was made manager of that group. Minor change.

Sometime in the mid-'60s I just -- '64, '65 -- I became product manager for functional fluids. They split that group and in 1967, early, mid spring -- something, I don't remember -- I moved back to director of marketing for oil additives. And I held that job until November 1969 when I left Monsanto.

Q In your job as manager of the oil additives and product manager of the oil additives and functional fluids group, what were your responsibilities?

A Well, the product manager basically is what

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I like to call the inside part of the sales department. Responsible for budgeting, forecasting, responsible for, quote, technical service and I suppose liaison with management. It was sort of the inside, if you will. Profit budgeting, forecasting, planning type of the marketing operation.

Q Did the sales staff report to you in that position?

A No. That was a whole different line of reporting.

Q Did you have contact with functional fluids or oil additive customers in that position?

A I had a lot of contact with oil additive customers because they were the major part of our business. I can't remember the proportion, but the major part of our business was with the major oil companies in oil additives and I had frequent contacts with them.

My contacts basically were some of the Monsanto management visiting and talking to the person. In the functional fluids area it was so highly technical I did not have a lot of contact with our customers in functional fluids.

Q Who did you report to in your job as product manager?

A I reported to -- I'm trying to remember what

they would call him. I guess he was assistant director of marketing -- or maybe they called him a director of marketing -- I'm not sure -- for product managers, if you will.

In other words, there were a group of product managers and the product managers reported to somebody. I can't remember what his title was.

Q What was his name?

A I'm sorry, there were probably two or three and I just don't remember.

Q In 1964 or 1965 you indicated that you became product manager for functional fluids; is that right?

A Uh-huh.

Q How were your job responsibilities different, if they were?

A I wouldn't say -- basically the product manager's job is similar for whatever group you're going to be product manager for. I think there would be very little difference.

Q Was it still the case that the salespeople reported up through a different line?

A Yes.

Q Who did you report to as a product manager for functional fluids?

A Again I'm sorry, I just don't remember.

Q Did you ever have any contact with a company called Texas Eastern Transmission Company?

A I never had a single contact with them.

Q What about a company called Transwestern Pipeline Company?

A Never had any contact with them.

Q Do you remember a product called MCS-153?

A I do not recall a product called MCS-153.

Q What about a product called Turbinol or Turbinol 153?

A Yes.

Q OS 85?

A For some strange reason OS 85 rings a bell.

Q What do you remember about that product?

A I don't remember anything about it except the name. I remember there was a fluid or something called OS 85. I have no recollection of the product at all.

Q In your work at Monsanto, did you have any familiarity with turbine driven gas pipeline compressors?

A None whatsoever.

Q Did you play -- in your role as product manager for functional fluids, what role if any did you play in the development of products?

A I didn't play any active role in the development. I'm trying to think. I guess that's the best answer I can give you. I didn't play an active role in the development of any products.

Q Can you specify for me -- how would you describe the role that you played in the development of products?

A As I recall I would receive copies of memoranda by people that handle this, and I would discuss from time to time, depending on what the project was and how important it was, with the people in my group who were carrying out these functions.

Q How many people reported to you as product manager for functional fluids?

A I believe there were five.

Q And can you recall the names of any of those people?

A Paul Benignus. Dick Davis I recall. And there was a fellow named Frank Langenfeld who handled, as I remember, the aircraft fluids. And there was another fellow, his first name was Stan. I want to call him Stan Smith, but that was a tennis player. His first name was Stan. And there was another one, but I can't recall.

Q Was the pydrol line of products within your responsibilities?

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A Yes.

Q Between these fellows that worked for you, what was the division of responsibility?

A Mr. Langenfeld was the aircraft expert, if you will, and Mr. Benignus we considered to be the expert on Aroclor for the electrical industry. And Mr. Davis was the, I suppose you'd call him the supervisor of the industrial fluid products.

Q Does that leave any major portions of your product line unaccounted for?

A I would say no.

Q You indicated that sometime in early to mid-1960's you went back to the marketing group as director of marketing for oil additives; is that right?

A Right.

Q Did you continue to have any responsibility for functional fluids?

A None at all.

Q Your job in December 1966 was still product manager for functional fluids; is that right?

A I'm quite sure it was.

Q And you first heard about research concerning possible environmental contamination by PCB's in December 1966; is that correct?

MR. ZIMMER: Assumes facts not in evidence.

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A No.

Q (By Ms. Grady) You can answer.

A Give me the question again.

Q You first heard about research in Sweden concerning PCB's as a possible environmental contaminant in December 1966; is that correct?

A No, I don't recall -- it's kind of strange. I recall somebody coming to me and I don't know when -- I just couldn't tell you within a year -- saying that in Sweden they had found some chlorinated hydrocarbons in a couple of sea gulls. That was the extent of the information given to me on that subject.

Q At that time; is that right? When you say that that was the extent of the information given to you on that subject, is that the extent of the information given to you about research in Sweden on PCB's?

MR. ZIMMER: I think he's indicated that's what he remembers about the subject.

Q (By Ms. Grady) With that understanding.

MR. ZIMMER: What she's getting at, did you find out more later or is that all you remember about the subject?

THE WITNESS: I guess in detail I have to say I don't recall finding out much more later. This was kind of the time when I was -- and I can't tell you

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exactly dates and so forth as to when various and sundry things happened, but I don't recall really anything that was acted upon or -- I don't know how to explain this -- that I remember other than this comment that a couple of sea gulls were killed in Sweden and I guess my reaction was, well -- I didn't have any reaction I guess. I don't know what it was to be honest with you.

Q (By Ms. Grady) Let's look at some documents and see if maybe that will spur some memories. I've pre-marked the exhibits and the first exhibit I'd like to use is Exhibit 1010 which I'll describe for the record as a one-page document bearing Bates number TRAN 003061, purports to be a memorandum from D.F. Smith to C.E. Butts, B-u-t-t-s, dated September 1, 1964, subject MCS-153 specifications. Mr. Buchanan is shown as a cc on the memorandum.

And the procedure I'd like to follow, Mr. Buchanan, is for a short memorandum if you'd go ahead and read the memorandum and the first question I always ask you is whether you've seen it prior to today?

A I've read it.

Q Mr. Buchanan, have you seen Exhibit 1010 prior to today?

A I don't recall having ever seen this memo.

Q And in 1964 your position was product

manager of functional fluids, right?

A Yes, ma'am.

Q Do you recognize the form of Exhibit 1010, meaning do you recognize this as a way of conveying information about a product within your area of responsibility that you've seen before?

A I would say this is the general type of memorandum that would be written, yes.

Q Does seeing this refresh any recollections about MCS-153?

A Not really, no.

Q Who is D.F. Smith?

A That's the other guy I couldn't remember. That's Dale Smith who worked in the product group at that time and I believe he worked for Dick Davis.

That was his -- I knew there was another one.

Q Mr. Davis you indicated had job responsibility for industrials?

A Yes.

Q Next exhibit I'd like to show you has been marked as Exhibit 1011 and I'll describe it for the record as a one-page document bearing Bates number TRAN 003064. Purports to be a form. Up at the top it says J.F. Queeny, Q-u-e-e-n-y, Plant Finished Product Specification, and Mr.

Buchanan is shown on the form as a manager.

Mr. Buchanan, do you recognize Exhibit 1011 as a form you're familiar with?

A I don't recall the form at all, but it appears to be a standard form for Monsanto.

Q Have you seen information about Monsanto products presented in this way before?

A Specifications? Yes.

Q And can you tell me what the difference is between Unrestricted Sales Limits shown there as the second column on this form and Internal Control Limits as it relates to a product specification?

A I don't have any idea.

Q This purports to be a product specification for MCS-153. Does this refresh your recollection in any way about that product?

A No, it certainly doesn't.

Q What about over on the right-hand side? See where it says Standard Master and then there's a list of approvals?

A Uh-huh.

Q Was it the practice at Monsanto at least in the area where you worked to have a series of people sign off on a product specification?

A I don't know.

Q The next exhibit I'd like to show you has been marked as Exhibit 1032 and it bears Bates number TRAN 003065, purports to be a tentative specifications form with the product name known as MCS-153 Rust Inhibited. Who is J.H. Davidson?

A I don't know.

Q I forgot to mention for the record that Mr. Buchanan's name is shown on the distribution list for this document.

Do you recall -- does seeing this document refresh any recollections you have about MCS-153?

A None at all. No, ma'am.

Q Was the formulation or the constituent ingredients of Monsanto products generally proprietary information?

A Yes.

Q The next exhibit I'd like to show you is Exhibit 1033. This is a multi-page exhibit bearing Bates TRAN 003389 through 003384. First page purports to be a memorandum from J.H. Davidson to P.N. Biven JFQ Plant. It's dated July 25, 1967. Mr. Buchanan's name is shown as one of the cc's. That memorandum is followed by several pages that look to be information about specifications for MCS-153 Rust Inhibited.

Mr. Buchanan, let me direct your attention

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to the second page of Exhibit 1033. Have you ever seen this page before?

A I don't recall ever seeing this page.

Q Does it look familiar to you as a form used by the Monsanto Company?

A I don't know.

Q Up at the top it says -- I'm looking at the line that says "By: Request From Sales Department." Was it the practice that a change in the specifications of a product would be requested by the sales department?

MR. ZIMMER: Calls for speculation.

A I don't recall. I'm sorry. I don't recall.

Q (By Ms. Grady) Do you know what phenyl-a-naphthylamine is under "Composition" on the second page?

A I don't know what it is.

Q Just to make sure we're covering all the bases here, let me show you one more of these.

A Okay.

Q This is Exhibit 1034. It bears Bates number TRAN 003066. It purports to be a form for tentative specifications for MCS-153 Rust Inhibited and it has handwriting on it and Mr. Buchanan is shown as a cc.

Mr. Buchanan, does your handwriting appear anywhere on Exhibit 1034?

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A No.

Q That handwriting down at the bottom seems to indicate that a new specification for Turbinol 153 was issued. That's the preamble. My question is whether seeing Exhibit 1034 refreshes your recollection in any way about any role or responsibility you had for Turbinol 153?

A No.

MR. ZIMMER: No foundation.

Q (By Ms. Grady) What was the pydrol line of products used for?

A The pydrol line was used for -- as fire resistant hydraulic fluids.

Q What is a hydraulic fluid?

A I guess it's a product that's used to -- I'm not sure I can tell you very good. Your brakes, you've got hydraulic fluid in your brakes. When you press on the brakes the fluid compresses and makes the brakes then stop the car. That's about the simplest explanation I can give you. I'm not really knowledgeable about hydraulic fluids.

Q Were hydraulic fluids or -- strike that.

Were the pydrol line of products formulated with PCB's at the time you were product manager for functional fluids?

MR. ZIMMER: You mean any particular fluid or all of them?

MS. GRADY: All of them.

MR. ZIMMER: Did all of them have PCB's?

Q (By Ms. Grady) Were they formulated with PCB's?

A My recollection is that there may have been one or two products which didn't have PCB's. I just don't remember. Most of the pydrols I recall had some PCB's, yes.

Q What was the first time you heard about PCB's?

A First time I ever heard about PCB's? I suppose the first time was back in my first job when I was testing plasticizers. We tested almost everything Monsanto made to see if it would make a good plasticizer and we tested PCB's so I'm sure that these days -- I don't recall any details, but I'm sure in those days I tested PCB as a plasticizer.

Q What was your understanding at the time you first recall hearing about PCB's concerning the toxicology of PCB's?

A I think that in all our products that we sold and put out we had toxicity information. I don't recall that we sent out any product or had a bulletin that didn't have something about toxicity and I suppose somewhere along the line in these early days I must have

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seen a bulletin with PCB's and I don't recall any detail at all on what was in a bulletin, but I would imagine there must have been something that said, as it was on every product that I remember we sold, about toxicity.

I can't remember that anything stood out in my mind about PCB toxicity. I don't remember along the line where it would have gone. I can't set an exact time other than what I read perhaps in the early days of Monsanto in the bulletin.

Q Let me show you the next exhibit which I've marked as Exhibit 1022, and just for the record this exhibit was marked in a different litigation as well so it has two exhibit numbers on it, but the one in this litigation is 1022 which I'll describe for the record as a memorandum from D. Wood to G.R. Buchanan dated December 1, 1966, Subject Aroclor Sweden, and I'd like you to read this exhibit in its entirety.

A Okay.

Q The Bates number is STR 017390.

Have you seen Exhibit 1022 prior to today?

A I don't recall having seen this before.

Q Is that your handwriting up above Mr. Woods' name?

A No, no.

Q Do you know who Ola Palm is?

A No, I don't.

Q Who's D. Wood?

A D. Wood? As I recall we had a man in Europe -- I assume that's David Wood, his name was David Wood -- who was concerned with, as I recall, the Aroclor operation over there.

Q Was there any reporting line between you and Mr. Wood?

A Not really.

Q Do you have any knowledge of why a memorandum about a report about Aroclors in Sweden would be sent to you or was sent to you?

A This is 1966?

Q Yes.

A We were both concerned with these products, and when things --

There was correspondence between Europe and the states from time to time and I would assume that's the reason he sent the memo.

MR. ZIMMER: Be careful not to assume, Mr. Buchanan. She's asking you what you recall.

THE WITNESS: I'm sorry.

Q (By Ms. Grady) What information was provided to customers of the functional fluids products concerning disposal of Aroclors?

A I don't know.

Q Do you recall passing along information concerning research overseas someplace that purported to indicate that PCB's were being found in the environment?

MR. ZIMMER: To whom passing along?

MS. GRADY: I'm getting to that.

Q (By Ms. Grady) To your colleagues within Monsanto?

A I do not, no.

Q Let me show you the next exhibit which is Exhibit 1023 bearing Bates number TRAN 056624. Purports to be a memo from R. Emmet Kelly to D. Wood dated December 12, 1966, subject Aroclor Sweden. Mr. Buchanan is shown as a cc.

And I'd like you to read this entire exhibit, Mr. Buchanan.

A Okay.

Q Have you seen Exhibit 1023 prior to today?

A I don't recall having seen this before.

Q Is that your handwriting up at the top?

A No.

Q Who is R. Emmet Kelly?

A Dr. Kelly was at the time I was there, I remember he was head of the medical department.

Q Did you have any discussions with Dr. Kelly

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about research done in Sweden concerning finding PCB's in fish?

A I don't recall having any with him at all.

Q Not at any time?

A Not at any time.

Q Does seeing this reference to salmon, pike and sea eagles refresh your recollection concerning what you heard about the research in Sweden?

A No, it doesn't.

Q The next exhibit is 1024, which I'll describe for the record as a one-page document marked TRAN 007566, purports to be a memorandum to a long list of people including Mr. Buchanan from D.V.N. Hardy, dated January 12, 1967, subject Aroclor Sweden.

And I'd like you to read this exhibit, please.

A He made me Dr. Buchanan. Okay.

Q Have you seen Exhibit 1024 prior to today?

A I don't recall as having seen this exhibit.

Q Who is D.V.N. Hardy?

A I don't know.

Q Mr. Benignus was the gentleman you mentioned who is shown here on the cc list with you who worked for you; is that right?

A Yes.

Q Did you ever provide Aroclor samples to Monsanto employees over in Europe to be given to some Swedish researchers?

A I don't know.

Q Are you familiar at all with Shell Chemical's operation in England doing research on PCB's?

A No, I'm not.

Q Do you recall an article -- strike that.

Do you recall ever reading the actual report of the research done by the scientists in Sweden?

A No.

Q Can I direct your attention up to the top of the document where there's a cc stamp that says "File Destroyed" and it's got a list of initials. Was there a policy or practice at Monsanto when you worked there as product manager for oil additives or functional fluids that certain documents after they were circulated were destroyed?

A I knew of no policy.

Q The next exhibit is 957 which has been marked in a previous deposition in this case and I'll describe it for ease of finding it in the deposition as what purports to be a memorandum from D. Wood to G.R. Buchanan dated January 26, 1967, with attachments, Subject Sweden, Aroclor.

You don't need to read this whole exhibit, Mr. Buchanan. If you'd flip through it, it's a memo followed by what purports to be a press release followed by what purports to be a chromatographic picture, I guess.

Tell me if you recall seeing Exhibit 957 prior to today.

A I don't recall ever seeing this document.

Q Did you ever read any press releases issued about the research done in Sweden on PCB's?

A I don't recall ever reading one.

Q Did you ever have the responsibility for gathering information at Monsanto concerning research that was being done in Europe about PCB's?

A No.

Q Did you have any responsibilities regarding Monsanto's response to research done about PCB's?

A Monsanto's response to who?

Q To research being done by non-Monsanto employees about PCB's?

A No.

Q Did you have any responsibilities at all with regard to PCB's?

MR. ZIMMER: At what point in time?

Q (By Ms. Grady) At any point in time after December 1st?

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A PCB's were part of my product group and I suppose you could say all the way to high -- how high you want to there was responsibilities for PCB's, so as products, I was the product manager that included PCB's in that product group.

Q And did you have any responsibility for making decisions about whether PCB's would continue to be constituent ingredients in the products in your product group?

A No.

Q Did you participate in discussions concerning information that PCB's were showing up in the environment as an environmental contaminant?

A I don't recall any.

Q Do you recall any discussions you ever had about PCB's at Monsanto? Let's limit it from '66 forward, not back when you were in the plasticizers group.

A Did I ever have any discussions on PCB's?

Q And also I'd like to take out the reference that you mentioned earlier about the sea gulls in Sweden that you've already provided testimony about.

A I'm sure that I discussed PCB's with the people that worked for me.

Q But you have no specific recollection of any discussions?

A I can't sit here and tell you a specific conversation that I had with my people on PCB's.

Q Do you recall having any communications with anyone about the stability of PCB's as it affected its biodegradation?

A No, I don't recall that.

Q Were you a participant in meetings where Monsanto's research efforts concerning PCB's were discussed?

A Say that again.

Q Did you participate in meetings where Monsanto's research efforts concerning PCB's were discussed? I'm talking about from December 1, 1966, forward.

A I can't recall any specific meetings that I sat in to discuss PCB's.

Q Do you have a general recollection that you participated in meetings where the subject was PCB's?

A I just can't recall specifically to give you an answer on that. I just can't be specific about meetings in which I attended about PCB's. It's been a long time.

Q Do you recall any research about PCB's toxicity in fish?

A I do not.

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Q Did you ever have any responsibility with dealing with press inquiries concerning PCB's?

A No, I did not.

Q The next exhibit is Exhibit 1026. It purports to be a two-page memorandum from R. Emmet Kelly to D. Wood dated February 10, 1967, showing Mr. Buchanan as a cc.

Maybe if you could skim this, Mr. Buchanan, and tell me if you recall seeing it before. Do you recall Exhibit 1026 as something you've seen before?

A No, I don't.

Q Did you have a meeting with Dr. Kelly and Mr. Wilde concerning PCB's sometime in the spring of 1967?

A I don't recall having such a meeting.

Q Did your group receive questions from its customers concerning PCB's in the spring of 1967?

A I don't recall getting requests from customers, no.

Q Were you responsible as either product manager for -- I guess it would be product manager -- for functional fluids for the NCR carbonless carbon paper account?

A Yes, the products that went into the carbonless carbon paper were in my group.

Q Did you have any discussions with anyone

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from NCR about PCB's and allegations that they tended to persist in the environment?

A No, I did not.

Q Who was Eugene Wilde?

A I don't know who Eugene Wilde was.

Q Are you familiar with someone named Mr. Ford at Monsanto?

A Ford?

Q I'm looking at the paragraph labeled No. 7 on the second page of Exhibit 1026. There's a reference to Mr. Widmark's letter to Mr. Ford of December 29, 1966.

A I sure don't remember any Ford.

Q Do you recall ever having any communications with customers of the functional fluids group concerning the toxicity of Aroclors?

A Did I have communications with customers -- can you please repeat that?

Q Did you ever have any communications with customers of the functional fluids group concerning the toxicity of Aroclors?

A No, I did not. At least not that I can recall.

Q Do you recall having communications with the people that worked for you when you were product manager for functional fluids about communications they had had

with customers about the toxicity of Aroclors?

A I just don't recall any communication -- any specific discussions on that subject, no.

Q Let me show you the next exhibit which has been marked in a previous deposition as Exhibit 281. And just so we can find it in the record, this document has two Bates numbers on it. One series is PRR 021889 through 021892, and the other is SCM 037311 through 037314 and purports to be a chronology concerning chlorinated biphenyls.

Have you seen Exhibit 281 prior to today?

A I don't recall having seen this exhibit.

Q Would you flip through here and see if you recognize any of the marginalia or handwriting on this document as yours?

A No, I do not.

Q Do you recall any discussions with your colleagues at Monsanto about putting together a chronology about PCB research?

A No, I don't recall.

Q The next document I'd like to show you has been marked in this litigation as Exhibit 550.

We're jumping ahead, Mr. Buchanan, just to orient you, to June 1969. And so we can find it in the record, this purports to be a June 4, 1969, agenda by

Mr. Wheeler of the medical department followed by some handwritten notes.

A Do you want me to read the whole thing?

Q No, just skim it. And I'll tell you this purports to be an agenda of a meeting on June 6, 1969, and there's some handwritten notes that look like they're probably someone's notes from the meeting. I'm not representing that's what they are, but just to orient you to these documents.

And what I want to know is if you recall being at a meeting in June 1969 or thereabouts where a presentation was made summarizing the research results of studies done outside of Monsanto concerning PCB's?

A No, I do not recall this meeting.

Q In June 1969 you were product manager for oil additives; is that right?

A In June of '69 I was marketing director for oil additives, yes.

Q Is that your handwriting starting on the second page of this exhibit?

A No, ma'am.

Q Do you recall any discussion at a meeting concerning the validity of the research done in Sweden?

A No.

Q The next exhibit has been marked in a

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previous deposition as Exhibit 933. Mr. Buchanan, is that your handwriting?

A No.

Q The next exhibit is Exhibit 552 which has been marked in a previous deposition. Mr. Buchanan, is that your handwriting?

A No, ma'am.

Q Did you participate in any recitations to the corporate management committee or the corporate development committee concerning PCB's?

A No.

Q Are you familiar with those terms, corporate management committee and corporate development committee?

A Not really. I don't remember how they fit in the organization or anything like that, no.

Q Why did you leave Monsanto in 1969?

A Monsanto sold a portion of their business -- the oil additive business -- to the Burma Oil Company and at that time Burma didn't have any operations in America and they needed somebody to run this operation that they just bought from Monsanto so I worked out a proposition with them to leave Monsanto and set up and run this Edwin Cooper, Incoroporated.

Q Do you recall the pydrol line of products being reformulated to take the PCB's out of them?

A I don't have any recollection of that at all.

Q When you left Monsanto, did Monsanto still have oil additives that contained PCB's?

A Did Monsanto still have -- you mean did the products that I subsequently was --

Q Let me see if I can make it clearer. You were marketing manager for the oil additives group?

A Yes.

Q Did those oil additives that you were responsible for at the time you left Monsanto, did they still have PCB's in them?

A My recollection is that none of our additives had any PCB's -- oil additives. I'd say basically none of our oil additives had PCB's in them. They were an altogether different type of business.

Q Is -- are you saying that no oil additives had PCB's at any time -- none of Monsanto's oil additives or at least while you were working with them? I don't care about going back into history.

A I don't recall that any of our oil additives or marketing products had any PCB's in them. I don't know. As I'm trying to think, I don't think we marketed anything that had PCB's in it in the oil additive area.

Q Those products were not made with Aroclors?

HARTOLDMON0039611

A No. The oil additives were a completely separate business.

MS. GRADY: I have no further questions. Any questions, Mr. Zimmer?

MR. ZIMMER: No.

MS. GRADY: Why don't we stipulate that as I understand it the original will be sent directly to Mr. Buchanan -- or through your office?

MR. ZIMMER: It doesn't matter.

MS. GRADY: Why don't we have it go directly to Mr. Buchanan. Mr. Buchanan will have 30 days to review it and to sign it and to return it to Mr. Zimmer and then you have how long to notify us that it's been signed? Is it 15 days? Is that reasonable?

MR. ZIMMER: That sounds fine.

MS. GRADY: If the deposition is not signed within those time frames, then we will be able to use it as if it was signed.

GEORGE BUCHANAN

HARTOLDMON0039612

STATE OF ARIZONA)
) ss.
COUNTY OF PIMA)

BE IT KNOWN that I, BARBARA F. BRODRICK, took the foregoing deposition pursuant to notice at the time and place stated in the caption thereto; that I was then and there a Notary Public in and for the County of Pima, State of Arizona; that by virtue thereof I was authorized to administer an oath; that the witness, GEORGE BUCHANAN, before testifying, was duly sworn to testify the truth, the whole truth, and nothing but the truth; that the testimony of said witness was reduced to writing under my direction; that the foregoing contains a full, true and correct transcription of the notes of said deposition.

I FURTHER CERTIFY that I am not of counsel nor attorney for either or any of the parties to said action or otherwise interested in the event thereof, and that I am not related to either or any of the parties to said cause.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my seal of office October 28, 1992.

Barbara F. Brodrick
Notary Public

My Commission Expires:
March 10, 1996

HARTOLDMON0039613

L A W Y E R ' S N O T E S

PAGE	LINE	

Rec'd BB&M
DEC 7 1992
No Calendar Entry PLH

BOULEY, SCHLESINGER, DI CURTI, and SCHIPPERS
REGISTERED PROFESSIONAL COURT REPORTERS
601 PIONEER PLAZA
100 NORTH STONE AVENUE
TUCSON, ARIZONA 85701
PHONE (602) 623-7573

JAMES E. BOULEY RPR, CSR, CM
LEBER SCHLESINGER RPR, CM
PETER L. DiCURTI RPR, CM
KENNETH W. SCHIPPERS RPR, CP

December 3, 1992

Shearman & Sterling
Attn: Ms. Janet M. Grady
725 South Figueroa Street
Twenty-First Floor
Los Angeles, Ca. 90017-5421

Re: Transwestern Pipeline Co.
vs. #BC026959
Monsanto Company

Dear Ms. Grady,

The original transcript of the deposition of Geroge Buchanan taken on October 16, 1992 on the above-entitled case, is being forwarded to you.

The deponent signed the transcript and made corrections and/or changes as shown on the attached sheet.

Very truly yours,

Linda McDonald, Secy.

cc: Mr. Donald F. Zimmer, Jr.

DEPONENT'S CORRECTIONS SHEET
PLEASE WRITE IN BLACK INK ONLY!

PAGE	LINE	
5	10	CHANGE "ST. LOUIS" to "SAN ANTONIO, TEXAS."
5	13	CHANGE "BURMA" to "BURMAH."
6	19	REMOVE THE WORD "BACK".
7	18	CHANGE "SOME OF THE" TO "REPRESENTING."
9	12	CHANGE "YES" to "NO".
9	13	CHANGE "05-85" TO "05-81".
9	14	CHANGE "05-85" TO "05-81".
9	18	CHANGE "05-85" TO "05-81".
11	12+13	CHANGE "EARLY TO MID-1960'S" TO " [redacted] MID TO
		LATE 1960'S".
32	18	CHANGE "BURMA" TO "BURMAH"
32	19	CHANGE "BURMA" TO "BURMAH"

Signature [signature]

General Office

September 1, 1964

MCS-153 SPECIFICATIONS

QUEENY - C. E. Butts

QUEENY-RA Geisman
WE Ault-WAUL
PN Biven-QUEENY
JD Sullivan-QUEENY
LR Stark-LSTAR
CL Early/RE Hatton-CEARL
GR Buchanan

The tentative specification changes for MCS-153 set forth in H. O. Schett's August 11 memo appear acceptable. We would not expect these changes to affect the functional properties of MCS-153.

We would suggest the foam and emulsion tests be retained on the list of "non-routine-report tests". These two properties can affect fluid performance and customer acceptance. The 100°F viscosity should be closely controlled and should not exceed the proposed limit.

D. F. Smith

/jel
(Specs. to W. E. Ault)

EXHIBIT
Plf. No. 1010
10-16-92

TRAN 003061

MONSANTO CHEMICAL COMPANY
ORGANIC CHEMICALS DIVISION
J. F. QUEENY PLANT
FINISHED PRODUCT
SPECIFICATION

PRODUCT CODE: 80802/[illegible]
DEPT. OR JOB:
USE: Sales - G. R. Buchanan, Manager
SALES CODE: 6124-000-11-01

STANDARD MASTER

Approved by	Date
[signature]	11/2/64
[signature]	11/9/64
[signature]	11/24/64
[signature]	12/1/64

12-4-64

PRODUCT (Trade Name): MCS-153
TYPE:
PRODUCT (Chemical Name):
TYPE:
CHEMICAL FORMULA:

Blend

MOL WT.

SUPERSEDES SPECS OF: 8-14-61 Tentative
SAMPLE FOR ANALYSIS: 2 x 16-ounce NN Bottles

TEST	UNRESTRICTED SALES LIMITS	INTERNAL CONTROL LIMITS	PROCEDURES
On each lot			
Flash point	330°F min.	340°F min.	52-A
Fire point	550°F min.	580°F min.	52-A
Pour point	+5°F max.	0°F max.	100-A
Viscosities:			126-A
@ 100°F	21.5 to 26.2 cs.	22.5 to 25.2 cs.	
@ 210°F	3.10 to 3.70 cs.	3.25 to 3.55 cs.	
Upon request			
Emulsion test	----	Report	*
Foam test (On sample as is)	----	Report	54-A

*This test to be made by Functional Fluids Applicatio Laboratory, if requested.

EXHIBIT
P.F. No 1011
10-16-92

TRAN 003064

IN 84 (REV. 12/60)

HARTOLDMON0039618

Brussels, Belgium

1st December, 1966

Aroclor Sweden

[illegible]gh

G. R. Buchanan & St. Louis

THIS COPY FOR

A. Arpino - Brussels
Dr. Emmet Kelly - St. Louis
B.V.H. Hardy - London
R.A. Steenrod - St. Louis

Dear George,

I attach a copy of a letter received from Ola Palm in Stockholm. I have sent copies of this letter also to the appropriate departments within our own organisation. In consideration of the importance we are placing on development of the Swedish market for Aroclor over the next five years, we would be grateful if you could arrange for this information to be considered by the appropriate departments in St. Louis and their comments transmitted to us as soon as possible.

Based on the recommendations made by our medical departments we shall have to decide whether to arrange for publication of data in Sweden or not.

In relation to the specific problem mentioned of disposal of used materials, we would be interested to learn how this problem is handled in America. In the U.K. many companies have been burying material in drums, material in the drums having been absorbed into vermiculite or some similar porous material. Has any entirely safe method been developed for the disposal of waste Aroclor ?

Best wishes.

GB.

pp. D. Wood.

P.S. Thinking of the total quantities of Aroclor used in Sweden compared with the much larger volumes of Pentachlorophenol and Sodium Pentachlorophenate, for water treatment in the paper industry and sometimes control in the timber industry. Is it likely that the chlorinated phenols show similar chromatographic traces to the chlorinated bi-phenols?

PLAINTIFF'S EXHIBIT 10

EXHIBIT Plf. No. 1022 10-16-92

STR 017390

Tx - Aroclor

St. Louis

December 12, 1966

AROCLOR SWEDEN

A. Arpino - BRUSSELS
G. R. Buchanan - CBUCH
D.V.M. Hardy - LONDON
R. A. Steenrod - RSTEE

Mr. D. Wood
BRUSSELS

I do not believe that we can glibly accept Aroclors as a synonym for polychlorinated phenols that were discussed at the meeting of scientists at the Wenner-Gren Centre in Stockholm on November 27.

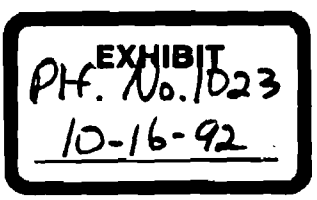
There are polychlorinated phenols which presumably could include derivitives from, or impurities in pentachlorophenol and, especially, 2,4-D and 2,4,5-T. These compounds would be much more liable to appear in salmon, pike, and sea eagles than any derived from Aroclors.

There are many chlorinated polyphenyls that can be formed during the manufacture of 2,4,5-T and probably pentachlorophenol as well. Our only problem is whether or not we want to bring these facts up and have our herbicide program receive another black eye. This, I will have to leave to your judgment.

I think the question here is primarily an analytical problem. How can we find out what product Mr. Jensen is talking about? Can we compare these chromatographic peeks that Mr. Jensen is describing with anything found in Aroclors, pentachlorophenol, 2,4,5-T, etc? I admit I am out of my depth here but I think another compound is indicted rather than Aroclor.

R. Emmet Kelly, M. D.

REK/ln



HARTOLDMON0039620

Monsanto

D.V.N. Hardy, London

12th January, 1967

Aroclor - Sweden

DVNH/ARW

10

P.G. Benignus, St. Louis
G.R. Buchanan, St. Louis
D.S. Cameron, Brussels
Dr. R. Emmet Kelly, St. Louis
G.R. Graham, New York
R.A. Steenrod, St. Louis
D. Wood, Brussels
J.A. Evans, London
R.A. Baxter, Ruabon

FILE	
Destroy	
JTG	
WHH	✓
MNJ	✓
REK	✓
RAM	
EPW	✓

JAN 16 1967.

EXHIBIT
Plf. No. 1024
10-16-92

On 2nd January 1967 Mr. A. Richardson of Shell Chemicals' Tunstall Laboratory, Sittingbourne, Kent talked with me over the telephone concerning the Swedish Press report relating to the identification of "Polychlorinated Biphenols" as trace contaminant in sea birds, fish etc. Richardson has been working for some years on the similar problem with insecticides such as DDT, which are known to have wide distribution in trace quantities. He had already found that the chlorine-containing residue contained substances more stable than DDT. and just as Sören Jensen reports he has obtained spectrographic evidence that these are very similar if not identical with Aroclors. He has obtained samples of Aroclors 1242, 1254, 1262 and 5460 from us, and would now like to have small samples of any chemically pure Aroclor constituents which we may be able to supply. Milligram quantities would suffice for his purpose.

Mr. Richardson was quite sure that the compounds reported to be "polychlorinated biphenols" are really meant to be polychlorinated biphenyls and as support he has sent me a copy of the synopsis of a paper entitled "Pesticide Analysis: Presence of Polychlorinated Biphenyls at Residue Analysis of Biological Samples" by Sören Jensen and Gunner Widmark (photocopy attached).

I discussed with Richardson the soundness of Jensen's claims, and was assured that his work and findings are sound. Jensen is on the staff of the Institute of Analytical Chemistry, University of Stockholm. A note on the staff and work of the Institute is attached. From this you will see that Jensen is wholly concerned with the analysis of chlorinated pesticides and with the work of stations for routine analysis.

I would be glad if Dr. Baxter and Dr. Buchanan would arrange to send me milligram samples of any pure Aroclor constituents that may be available at Ruabon and St. Louis respectively.

COMPANY CONFIDENTIAL

D.V.N. HARDY

TRAN 007566

HARTOLDMON0039621

St. Louis

February 10, 1967

G. R. Buchanan - GBUCH
J. Filer - BRUSSELS
D.V.N. Hardy - LONDON
Eugene Wilde - EWILD

Mr. D. Wood
LONDON

We have had a rather extensive meeting, which included the St. Louis individuals receiving copies of this memorandum, on Aroclor in the air and in various fish and other living reservoirs.

The decision was that more information had to be gained, and whether this would necessitate a trip from someone in the Medical Department to the various agencies working on this problem in Europe would depend upon how easily obtainable these gaps in our knowledge are by other means than personal communication.

We are very worried about what is liable to happen in the states when the various technical and lay news media pick up the subject. This is especially critical at this time because air pollution is getting a tremendous amount of publicity in the United States.

We have been receiving quite a few communications from our customers, but the most critical one is NCR, who are very much involved with their carbonless carbon paper.

I have listed a number of points referring to information I would like to have. Some of these may be easy to answer; others might take a little bit of investigation and some might not be feasible to answer at this time. However, please let me know your ideas on each one of the following items:

1. Can we get the original articles in the Swedish press, including Dagens Nyheter? I have a good fluent Dane who translates Swedish very well and is a physician and investigator, so nothing will be lost in the translation.

2. Who were the participants in the ~~contest~~ CONFERENCE referred to in your memorandum to Mr. Buchanan of January 26? Under whose auspices was it held and were there any reports issued? What were the conclusions of the conference and was any action decided upon?

EXHIBIT
Plf. No. 1026
10-16-92

COMPANY CONFIDENTIAL

HARTOLDMON0039622

3. What was the medical institute in Sweden that was going to do the toxicological work referred to in the same memorandum to Mr. Buchanan? Who was going to pay for it and what was the scope of the investigation?

4. In LKB press release of January 10, they stated that 12 OECD nations were going to do work on this problem. Can anything be found out about the extent of this work? Who is doing it, and at what institutes?

5. What is known about the work in England at the Monks Wood Experimental Station and the Laboratory of Chemists in London? How long has this gone on? Is it an ongoing study? What are the perimeters of the study?

6. Do we have the complete paper in Swedish of Jenssen and Widmark entitled "Pesticide Analysis--Presence of Polychlorinated Biphenyls and Residual Analysis of Biological Samples"? This was referred to in D.V.N. Hardy's letter of January 12, 1967. I would like to get this original paper with the bibliography in Swedish.

7. Can I have more information about the Carlin Institute of Toxicology which was referred to in Mr. Widmark's letter to Mr. Ford of December 29, 1966? What do they intend to do? Who is the contact, and is it located in Stockholm?

By copy of this memorandum, I am asking Dr. Hardy to find out what the situation is in the two English contacts referred to in item 5.

The consensus in St. Louis is that while Monsanto would like to keep in the background in this problem, we don't see how we will be able to in the United States. We feel our customers, especially NCR, may ask us for some sort of data concerning the safety of these residues in humans. This obviously might be opening the door to an extensive and quite expensive toxicological/pharmacological investigation. Before starting this, we certainly want to find out what is going on and not duplicate any of the work. I have tried to call you for the last two days and I will be out of town next week, but I would like to call you the week of the 20th. Perhaps by then you might have some answers to some of the questions.

COMPANY
CONFIDENTIAL

R. Emmet Kelly, M. D.

REK/ln

TRAN 056620

MONSANTO COMPANY
ORGANIC CHEMICALS DIVISION
J. F. QUEENY PLANT

TENTATIVE SPECIFICATIONS

PRODUCT CODE: 80953 | DEPT. OR JOB:
SALES CODE:
PROPOSED BY: J. H. Davidson

DISTRIBUTION
E.D.CLEMONS - 1
F.W.COPANAS - 1
J.A.STEPP - 1
R.A.GEISMAN - 6
H.O.SCHOTT - 1
J.H.DAVIDSON-1-GO/
L.R.STARK-1-GO/Res
W.E.AULT - 1 - GO/
G.R.BUCHANAN-1-GO/
Standards Files -

NAME: MCS-153 - RUST INHIBITED

CHEMICAL FORMULA: Blend

MOL. WT.:

DATE PROPOSED	EFFECTIVE UNTIL	SAMPLE FOR ANALYSIS
7-24-67	July 15, 1968	2 x 16-ounce NN bottle

NOTE: All samples processed by this tentative specification will require disposition of the authorized releasing agent.

TEST	UNRESTRICTED SALES LIMITS	INTERNAL CONTROL LIMITS	PROCEDU
On each lot			
Flash point	330°F min	340°F min	50-
Fire point	550°F min	580°F min	50-
Foam test - Sequence #1:			54-
Tendency	Less than 100 ml	Report ml	
Stability	Report in seconds	Report in seconds	
Pour point	+5°F max	0°F max	100-
Neutralization number	Acid: 0.40 max	Acid: 0.25 max	80-
Viscosities:			126-
At 100°F	21.5 to 26.2 cs	22.5 to 25.2 cs	
At 210°F	3.10 to 3.70 cs	3.25 to 3.55 cs	

EXHIBIT
PLF. No. 1032
10-16-92

TRAN 003065

HARTOLDMON0039624

Monsanto

FROM (NAME & LOCATION): J. H. Davidson - Research Center

DATE: July 25, 1967

SUBJECT: RUST INHIBITED MCS 153

REFERENCE:

TO [redacted] P. N. Biven - JFQ Plant

cc
W. R. Richard WRICH
L. R. Stark LSTAR
J. D. Sullivan JSULL
G. R. Buchanan/ R. Davis GBUCH
D. F. Smith DSMIT
E. D. Clemens - JFQ

Please promulgate the attached tentative blend sheet, for rust inhibited MCS 153. This blend is the same as MCS 153 except that Santolube 70 has been added in the amount of 0.3%. Also, a specification on acidity has been added for the rust inhibited blend.

J. H. Davidson

JHD:ms

Att. (1)

EXHIBIT
Plf. No. 1033
10-16-92

COMPANY CONFIDENTIAL

TRAN 003379

HARTOLDMON0039625

Established: July 24, 1967

By: Request From Sales Department

Composition:

81101	Aroclor 1242	75.10 lbs.
81115	Aroclor 1232	12.75 lbs.
80071	Tricresyl Phosphate	10.00 lbs.
80974	FH-139*	1.80 lbs.
82113	Santolube 70	0.30 lbs.
43350	Phenyl-a-naphthylamine	0.05 lbs.
31100	Dow Corning 200 Fluid - 350 cs.	0.005 lbs. (50 ppm)

Tentative Specifications:

Test	Unrestricted Sales Limits	Internal Control Limits	Procedure
Flash Point	330°F Min.	340°F min.	50-A
Fire Point	550°F min.	580°F min.	50-A
Foam test-Sequence #1:			54-A
Tendency	Less than 100 ml	Report ml.	
Stability	Report in seconds	Report in seconds	
Neut. No. (Acid)	0.40	0.25 max.	80-B
Pour Point	+ 5°F max.	0°F max.	100-A
Viscosities:			126-A
@100°F	21.5-26.2 cs.	22.5-25.2 cs.	
@210°F	3.10-3.70 cs.	3.25-3.55 cs.	

*Special Precautions:

The 1.8% poly (oxybutylene-MDT) diol (FH-139) is the average percent of polymer needed to impart the required viscosities to the final formulations in laboratory runs. FH-139 is prepared as a 50% solution in Aroclor 1242 (Tentative Process P-1216) and its effective thickening power varies from batch to batch. The 1.8% polymer charge is valid - only if the viscosity of a 4% solution of FH-139 in Aroclor 1242 falls into the 35 to 37 cs. range at 100°F. If the 4% control solution of FH-139 is outside of this viscosity range the required polymer change will have to be determined by formulation studies. In adding the FH-139 as a 50% solution of Aroclor 1242, the corresponding correction will have to be made for the aroclor 1242 required for MCS 153. A given batch of FH-139 should not be formulated into MCS 153 until the corrective dilutions are determined by the Functional Fluid Application Laboratories (St. Louis Research).

Blending:

See Process - Section III. Mix one hour at 50-50°C.

COMPANY CONFIDENTIAL

Toxicity and Hazards:

Normal Precautions

TRAN 003380

Tentative Issue #1: July 26, 1967

Review date: 7-15-68

Developed by: J. H. Davidson
Approved by: L. R. Stark

HARTOLDMON0039626

4-19-66 a MCS 153

Established: ~~July 24, 1967~~

By: Request From Sales Department

Composition:

81101	Aroclor 1242	75.10 lbs.
81115	Aroclor 1232	12.75 lbs.
80071	Tricresyl Phosphate	10.00 lbs.
80974	FH-139*	1.80 lbs.
82113	Santolube 70	0.30 lbs.
43350	Pheryl-a-naohthylamine	0.05 lbs.
31100	Dow Corning 200 Fluid - 350 cs.	0.005 lbs. (50 ppm)

Tentative Specifications:

Test	Unrestricted Sales Limits	Internal Control Limits	Procedure
Flash Point	330°F Min.	340°F min.	50-A
Fire Point	550°F min.	580°F min.	50-A
Foam test-Sequence #1:			54-A
Tendency	Less than 100 ml	Report ml.	
Stability	Report in seconds	Report in seconds	
Neut. No. (Acid)	0.40	0.25 max.	80-B
Pour Point	+ 5°F max.	0°F max.	100-A
Viscosities:			126-A
@100°F	21.5-26.2 cs.	22.5-25.2 cs.	
@210°F	3.10-3.70 cs.	3.25-3.55 cs.	

*Special Precautions:

The 1.8% poly (oxybutylene-MDT) diol (FH-139) is the average percent of polymer needed to impart the required viscosities to the final formulations in laboratory runs. FH-139 is prepared as a 50% solution in Aroclor 1242 (Tentative Process P-1216) and its effective thickening power varies from batch to batch. The 1.8% polymer charge is valid - only if the viscosity of a 4% solution of FH-139 in Aroclor 1242 falls into the 35 to 37 cs. range at 100°F. If the 4% control solution of FH-139 is outside of this viscosity range the required polymer change will have to be determined by formulation studies. In adding the FH-139 as a 50% solution of Aroclor 1242, the corresponding correction will have to be made for the aroclor 1242 required for MCS 153. A given batch of FH-139 should not be formulated into MCS 153 until the corrective dilutions are determined by the Functional Fluid Application Laboratories (St. Louis Research).

Blending:

See Process - Section III. Mix one hour at 50-50°C.

Toxicity and Hazards:

TRAN 003382

Normal Precautions

~~Tentative~~ Issue #1: July 26, 1967 - Supersede data for MCS 153 1

~~Review date: July 68~~

Developed by: J. H. Davidson
Approved by: L. R. Stark

COMPANY CONFIDENTIAL

HARTOLDMON0039627

MCS 1531

Established: April 19, 1966

Composition:

81101	-	Aroclor 1242	-	75.10 lbs.
	-	Aroclor 1232	-	12.75 lbs.
80071/80180	-	Tricresylphosphate	-	10.00 lbs.
	-	FH-139*	-	1.80 lbs.
82113	-	Santolube 70	-	0.30 lbs.
43350	-	Phenyl-α-naphthyl-amine	-	0.05 lbs.
31100	-	DC-200 Fluid	-	0.005 lbs. (50 ppm.)

Specifications of 4/19/66:

Test	Unrestricted Sales Limits	Internal Control Limits	Procedure
Flash Point	330°F min.	340°F. min.	50-A
Fire Point	550°F. min.	580°F. min.	50-A
Pour Point	+5°F. max.	0°F. max.	100-A
Viscosities:			126-A
at 100°F.	21.5 to 26.2 cs.	22.5 to 25.2 cs.	
at 210°F.	3.10 to 3.70 cs.	3.25 to 3.55 cs.	
Foam Test		Report	54-A
Sequence #1	Tendency - less than 100 cc Stability-seconds (report)		

*Special Precautions:

The 1.8% poly(oxybutylene-MDI) diol (FH-139) is the average percent of polymer needed to impart the required viscosities to the final formulation in laboratory runs. FH-139 is prepared as a 50% solution in Aroclor 1242 (Tentative Process P-1216) and its effective thickening power varies from batch to batch. The 1.8% polymer charge is valid - only if the viscosity of a 4% solution of FH-139 in Aroclor 1242 falls into the 35 to 37 cs. range at 100°F. If the 4% control solution of FH-139 is outside of this viscosity range the required polymer change will have to be determined by formulation studies. In adding the FH-139 as a 50% solution of Aroclor 1242, the corresponding correction will have to be made for the Aroclor 1242 required for MCS 153. A given batch of FH-139 should not be formulated into MCS 153 until the corrective dilutions are determined by the Functional Fluid Application Laboratories (St. Louis Research).

COMPANY CONFIDENTIAL

TRAN 003383

BU 4/10/67

HARTOLDMON0039628

Blending:

See Process - Section III. Mix one hour at 50° - 60°C.

Toxicity and Hazards:

Normal precautions.

Issued by: J. D. Sullivan

9/22/66

COMPANY CONFIDENTIAL

TRAN 003384

HARTOLDMON0039629

MONSANTO COMPANY
ORGANIC CHEMICALS DIVISION
J. F. QUEENY PLANT

TENTATIVE SPECIFICATIONS

PRODUCT CODE: 80952
DEPT. OR JOB:
SALES CODE:
PROPOSED BY: J. H. Davidson

DISTRIBUTION
E.D.CLEMONS - 1
F.W.COPANAS - 1
J.A.STEPP - 1
R.A.GEISMAN - 6
H.O.SCHOTT - 1
J.H.DAVIDSON-1-GO/Re
L.R.STARK-1-GO/Res
W.E.AULT - 1 - GO/B2
G.R.BUCHANAN-1-GO/B2
Standards Files - 3

NAME: MCS-153 - RUST INHIBITED

CHEMICAL FORMULA:

Blend

Cancelled 8/18/70

MOL. WT.

DATE PROPOSED: 8-15-67*
EFFECTIVE UNTIL: July 15, 1968
SAMPLE FOR ANALYSIS: 2 x 16-ounce NN bottles

NOTE: All samples processed by this tentative specification will require disposition of the authorized releasing agent.

*Product code in error on 7-24-67 issue.

TEST	UNRESTRICTED SALES LIMITS	INTERNAL CONTROL LIMITS	PROCEDURE
On each lot			
Flash point	330°F min	340°F min	50-A
Fire point	550°F min	580°F min	50-A
Foam test - Sequence #1:			54-A
Tendency	Less than 100 ml	Report ml	
Stability	Report in seconds	Report in seconds	
Pour point	+5°F max	0°F max	100-A
Neutralization number	Acid: 0.40 max	Acid: 0.25 max	80-B
Viscosities:			126-A
At 100°F	21.5 to 26.2 cs	22.5 to 25.2 cs	
At 210°F	3.10 to 3.70 cs	3.25 to 3.55 cs	

New spec issued as Format 153

EXHIBIT
Plf. No. 1034
10-16-92

TRAN 003066

HARTOLDMON0039630

MONSANTO EUROPE S.A.

11/26/67 X

FROM (NAME & LOCATION): Brussels, Belgium

DATE: 26th January, 1967

SUBJECT: SWEDEN, AROCLOR

REFERENCE: DW:gb

TO: G. R. Buchanan - St. Louis

oo P. G. Benignus - St. Louis
D. S. Cameron - Brussels
Dr. D. V. N. Hardy - London
Dr. R. Emmet Kelly - St. Louis
R.A. Steenrod - St. Louis

Hal Hargett - Brs

We recently sent you a translation of a Swedish newspaper article referring to the identification in nature of polychlorinated biphenols. Because some of the uses claimed for the materials fell in line with the uses of our own chlorinated diphenyls, we made a point, during our recent visit to Sweden, of visiting the research institute involved and discussing their particular programme of work.

To eliminate any earlier confusion that there may have been, I should like to emphasise that there is no doubt that the chemical which is the subject of the investigation and the news release, is chlorinated diphenyl i.e. Aroclor.

The company that supplied the mass spectrometer which was used in the research programme, in fact have recently put out a press release on this work. Although I am horrified by some of the headlines in this press release, it does basically describe the research programme carried out in Sweden, and describes in clear terms how chlorinated diphenyls were identified I therefore, enclose a copy for your files.

Jensens only aim in life as an analytical chemist, was to identify the substances found in his research work on the occurrence of insecticides in nature. The unfortunate aspect of the situation is the comments which have been added to Jensens work. He showed what was present and unqualified people have made statements as to the possible effect of what he has found.

Summarising the publication position, there were original articles covering the Stockholm conference in the Swedish daily press, and these reports were picked up also by the Danish press. You will have seen from D.V.N. Hardy's memo of the 12th January that it has also been picked up by the Shell Chemicals Laboratory in Kent, U.K. Jensen also divulged that he had been contacted by the Swedish American press agency who intended to include information about this research work in their monthly review "The Swedish American Journal". There is additionally the press review issued by LKB Productor AB which I imagine to have been sent to a number of technical journals.

EXHIBIT
Plf. No. 957
10-14-92

TRAN 085947

.../...

HARTOLDMON0039631

Effect in Sweden

This matter was raised with us by every capacitor manufacturer in Sweden that we visited. Fortunately there has not been too much adverse comment as yet from plant workers since they have not associated the polychlorinated biphenols mentioned in the article with Aroclor or Pyralene used in the Swedish factories. Jensen, however, stated that he had been approached personally by several workers associated with chlorinated diphenyls for non-electrical uses and these workers were quite worried as to the possible effect on their health.

Future Research

Arrangements are being made in Sweden for this work to be taken over by one of the medical institutes who hope to study the toxicology of the poloychlorinated diphenyl residues at the levels of concentration found by Jensen. Additionally a geographical survey is to be carried out to try and determine where the highest concentrations of residue are appearing and, if possible, to detect from this the method of escape so that more security precautions can be taken. We were asked by Jensen if it was possible for Monsanto to supply any samples of the pure isomers of chlorinated diphenyl since his work indicated at the moment that the lower chlorinated isomers are fairly easily metabolised, and the potentially more dangerous constituents are the more highly chlorinated members. If he can get hold of pure isomers, he would like to carry out some work on comparitive rates of metabolisation.

Jensen is forwarding me copies of his mass spectrographs and details of sample preparation so that we have all the details of his research work.

The point that I have made to Jensen is the need for care in any further publication of his work which is made. He accepts that the toxicology of chlorinated diphenyls should only be discussed with detailed information about exposure concentrations and exposure times and that generalised statements out of context can only arouse undue public concern. If any technical journal takes up the press release from the LKB Productor Company, there is little that Monsanto could, or should do in the way of publishing rebuttals. We do not want, personally as Monsanto to get too involved in this question. I am hopeful that we

HARTOLDMON0039632

might persuade Jensen himself to write a letter defining the true extent of his own research work and placing his results in their proper perspective. It would certainly be helpful in gaining his further support if we were able to make available to him any small quantities of pure isomers.

Since we are not alone in supplying polychlorinated diphenyls to the Scandinavian market, I have drawn this matter to the attention of the other askarel manufacturers in Europe.

As you will see from the press release one of the major points that is made is the difficulty in disposing of waste chlorinated diphenyls and again I must mention that constructive recommendations for the safe disposal of our materials would be most helpful.

D. Wood.

TRAN 085949

HARTOLDMON0039633

LKB PRESS RELEASE

IN THE SERVICE OF SCIENCE

F 1/10/67

Not for release until January 10, 1967

POISON! - LKB HELPS TO MAKE A SAFER WORLD

Swedish firm produces instrument that detects a previously unobserved poison in fish, fowl and mammal

The Nature of the Poison

The poison that has been isolated is a hitherto unobserved chlorinated hydrocarbon having eight chlorines in the molecule. This polychlorinated biphenyl (PCB) was isolated in residue analysis carried out with the LKB Combined Gas Chromatograph-Mass Spectrometer, LKB 9000.

100 (ng) of residue from 20 mg of fat, taken from a Sea Eagle found dead in the Stockholm archipelago, was used in the analysis which was made by Sören Jensen, of the Institute of Analytical Chemistry of the University of Stockholm, who has been engaged on this type of research for some considerable time. The dramatic importance of this discovery can best be understood by studying the main characteristics of PCB:

1. Very high stability. Capable of being boiled with nitric acid without destruction.
2. Has hardly any metabolism in living organisms. Can have a steady build-up in the human body and traces have been found in both adults and children.
3. If more than four chlorines are present PCB is non-inflammable.

As well as isolating a poison this research has drawn attention to the need for close co-operation in two parallel lines of investigation. The study of the persistency and toxic effects of herbicides, pesticides and related chemicals, which for some time now has caused general concern throughout the world, and the quest for improved methods of assessing the pollution of industrial waste.

How the Substance was Identified

Initial research seemed to indicate that this, then unknown, poison occured as a result of the use of insecticides; the usual organochlorines present in insecticide research were detected pp^1-DDT, pp^1-DDE and pp^1-TDE and certain unknown compounds

TRAN 085950

HARTOLDMON0039634

were thought to be metabolites of the insecticides The location of the poisons in fish, in birds and on pine needles appeared to strengthen this theory. Further investigations however, including electron capture techniques, gave indications that this supposition was incorrect.

It was, at this stage, decided to use the LKB 9000 Combined Gas Chromatograph-Mass Spectrometer to obtain more definite knowledge of the chemical nature of these unknown compounds, their molecular weight, and number of chlorines for instance, as this was known to be the only method currently available which could give the highest degree of positive identification. Analysis had so far produced a chromatogram from which it was possible to estimate that the Eagle sample, previously mentioned, contained DDT and DDE in extractable fat at a concentration up to 13 g per kg, and the unknown compounds in more or less the same quantities. Many of the retention times however were not in agreement with those for any known pesticides and a high proportion of unknown peaks were present. The purified sample from the Sea Eagle was injected on the LKB 9000 and the mass spectrograms which were obtained of the unknown peaks showed their mass numbers to be as follows: 426, 392, 358 and 324. The molecular difference in each case being 34 mass units thereby showing a family relationship between the unknowns

Chlorine exists as a mixture of two isotopes with atomic weights 35 and 37 in proportions of 75:25. If the molecule has one chlorine, two peaks will be obtained, one for Cl_{35} and one for Cl_{37}. If there are two chlorines it is possible to have one peak with only Cl_{35}, one with both Cl_{35} and Cl_{37} and one with two Cl_{37} and so on, so the relationship between the peaks on the mass spectrogram were found to be:

Molecular weight:	324	358	392	426
Chlorine content:	5	6	7	8

Having obtained this information it was possible to calculate the molecular weight of the parent hydrocarbon (PHC) and this was found to be 154. The most probable formula for a compound having carbon and hydrogen and giving the molecular weight of 154 is $C_{12}H_{10}$ and this can only be satisfied when the parent hydrocarbon is biphenyl and the unknown polychlorinated biphenyl.

Once this fact had been established an approach to industry elicited the answer that PCB was fairly extensively used, and when a sample was obtained and run through the LKB Combined Gas Chromatograph - Mass Spectrometer it was found that the gas chromatograph gave the same retention time for both the Eagle sample and the industrial sample, and the mass spectrometer gave exactly matching peaks, thus providing absolute verification of the previous analyses. TRAN 085951

To cross check on the results and to more fully evaluate their significance, the feathers from a stuffed Sea Eagle (circa 1880), from a Stockholm museum were also ana-

HARTOLDMON0039635

lyzed and no trace of poison of any kind was discovered. This research was continued

with other dated specimens and the first trace of DDT and its metabolized DDT was discovered in a specimen circa 1948/49 and PCB in 1942.

It has been mentioned earlier that traces of PCB were found on pine needles which seemed to indicate wind-blown insecticide, but this is undoubtedly due to the fact that where PCB has 40% or more chlorines it is not consumed when industrial waste is burnt but is thrown out in the smoke and air-borne over considerable distances.

The effect of this poison on man is not yet fully known. In 1936 tests showed that 23 out of 24 men employed in manufacturing PCB suffered from an acne, which appeared 6 to 8 months after handling the substance, and in 1937 it was [illegible] responsible for the death of three young workers. Tests so far carried out on animals indicate that in all cases the liver degenerates and that generally the skin and the liver are the parts of the body susceptable to the poison.

Current Research

Jefferies and Walker of the Monks Wood Experimental Station in England have recently carried out experiments to determine the survival and reproduction of Bengalese Finches and have found a high proportion contain organochlorines. They are investigating the possibility of using the residue content of the liver as an indicator of the dose consumed.

Simmons and Tatton of the Laboratory of the Government Chemist, London, England have investigated organochlorine residues in human gallstones and have found them present in 28 patients from 2 hospitals.

These two lines of investigation have been concerned with insecticide and pesticides but they do serve to show the wide field in which traces of organochlorines occur.

Some twelve O.E.C.D. nations, among whom are the Scandinavian countries, U.S.A., Great Britain, France and Holland are co-operating in research into the prevalence of this virulent and dangerous substance.

LKB

LKB-Produkter AB is fully sensible of the dedication of the scientists taking part in this work in which it has had the honour and privelege to play an important role by providing an instrument, the LKB 9000 Combined Gas Chromatograph-Mass Spectrometer, to give them their first break-through by providing positive identification of PCB.

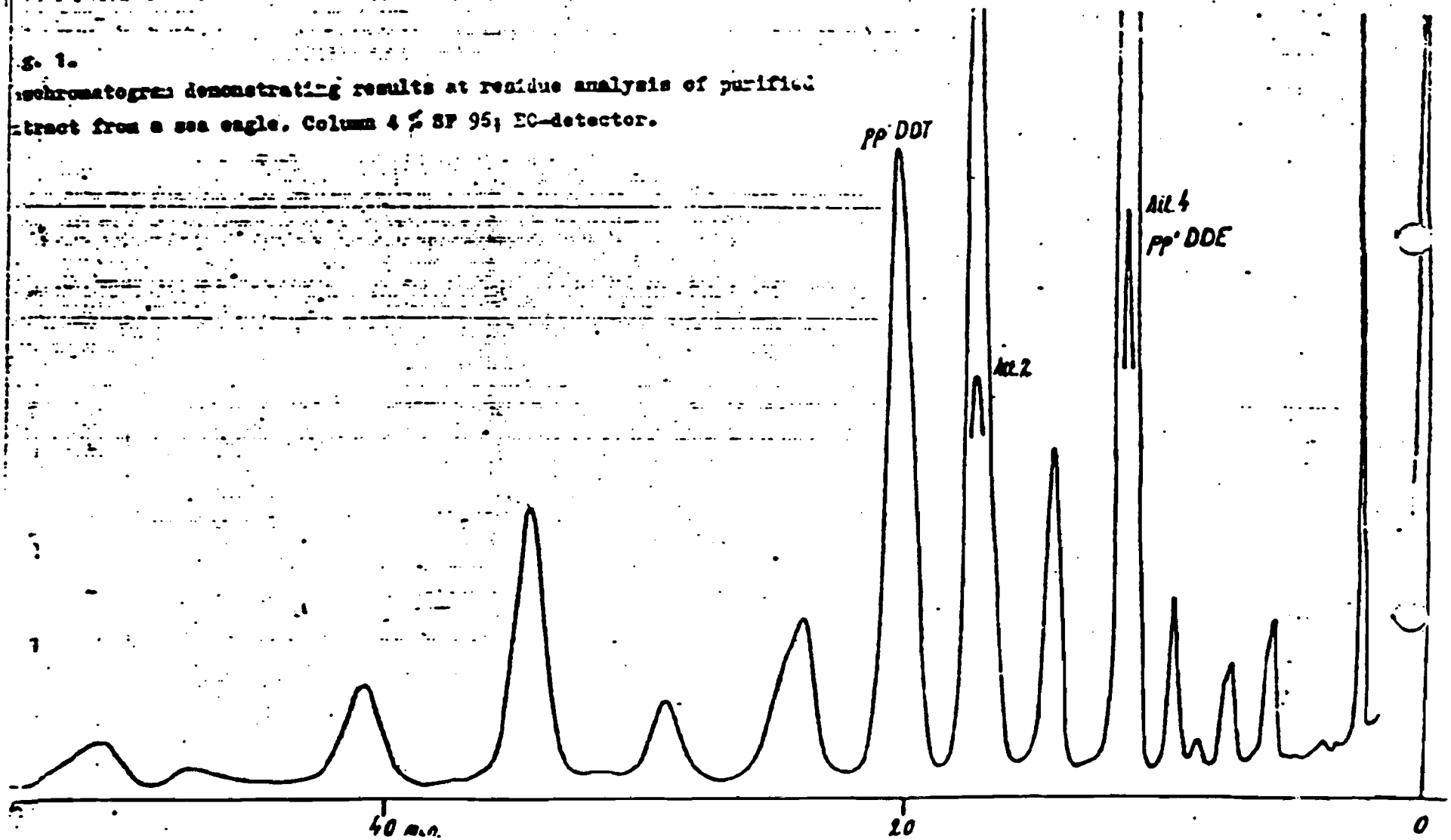
TRAN 085952

Publicity Department

HARTOLDMON0039636

g. 1.

chromatogram demonstrating results at residue analysis of purified extract from a sea eagle. Column 4 % SF 95; EC-detector.



TRAN 085953

HARTOLDMON0039637

E. P. Wheeler - Medical Dept.

June 4, 1969

REVIEW OF AROCLOR-IN-ENVIRONMENT STATUS SALES--USE IMPLICATIONS AND CONTROL

Howard S. Bergen, Jr.
Charles J. Smith
James E. Springate

W. R. Richard
R. E. Keller
E. S. Tucker
C. Paton
G. R. Buchanan
W. A. Kuhn
P. B. Hodges
Tom Ford
R. E. Kelly, M. D.

Meeting - Bldg. A-303
2:00 p.m. Friday, June 6

Confirming my telephone contact with a number of you a meeting has been scheduled as indicated above to review the current situation involving polychlorinated biphenyls and environmental contamination. Below is a suggested agenda which, of course, can be varied to fit the needs and interest of those attending.

SUGGESTED AGENDA

1. Status in U.K. & Europe
   Richard, Keller and Wheeler

2. Status in U.S.
   a) DDT (and PCB)-Wisconsin-Public Relations - Ford
   b) State and possible Federal restrictions on persistent chlorinated hydrocarbons - Wheeler
3. Status of Research Efforts
   a) Analytical - Keller and Tucker
   b) Toxicity studies - Wheeler
   c) Plans for effluent and river sampling; in Alabama and on the Mississippi - Hodges
   d) Possibility of Government grant for waste treatment studies and treatment plant - Richards & Wheeler
   e) Other environmental sampling and analysis?

4. Customer relations
   a - Dielectric fluids
   b - Functional fluids
   c - Oil and grease additives
   d - Cutting oils
   e - General plasticizers
   f - Rubber base paints
   g - others (?)

Elmer P. Wheeler

EPW:ojs

EXHIBIT
Plf 550
8/14/92

TRAN 058981

HARTOLDMON0039638

Friday - A Bldg -
Meeting

Elmer Wheeler -
Paul Hodges
Don Olson
Howard Bergen
Jim Springgate
T Ford
E John
& Others

E. Wheeler - Call Reports

① Fisheries - U.K. -
OECD - 12 European countries

Has investigated DDT in Trout -
Fish does concentrate 1 part/M
PCB could do the same thing -

② Shell people Great Britain
100 parts/M - No affect on Chickens

TRAN 057762

③ British Gov't Labs -
- Have found birds with 100's of parts per million PCBs - leads to wonder where they are getting it.

HARTOLDMON0039639

Sweden -

Dr Jensen -
Will probably be the one
to pull together all research
efforts on PCB's to date,

- DDT banned in Sweden for 2 yrs.
- using substitute products -

NB — Pentachlorophenol - (about 2 yrs. ago)
Jensen claimed this
appeared in Fish the Sweden
were eating.

Probably no move to limit use
of PCBs in Sweden for perhaps
a year.
- electrical uses - probably OK
- Paints (ships etc)

Widmark - Swedish Scientist -
Has identified PCB -
- seems to be working for group that
wants chlorinated compounds banned
- lower chlorinated compounds may be
O.K.

TRAN 057763

HARTOLDMON0039640

Questions seem to be

1.) ~~Wh~~ How is PCB getting into Nature?

2.) Is it possible PCB's are developed in Nature?

(4) Netherlands — Think Bayer is dumping stuff in Rhine River —

(5) Bayer — 1.) checking Mfring people — physical conditions.
2.) Fish Toxicity Studies
3.) Working up usage information

(6) Propol — uses Antimony chloride
Others use Iron-Chloride

Propol — man theorized that bombing of plants during WWII released which reaches to atmosphere & is just now showing up.

TRAN 057764

(NB) - Position Statement -
- May need revision again -

Continue Working DDT
and other Chlorinated Pesticides

- Research -
Soil -
Bob -

1.) Developing Methodology
- specifics of doing Examination Work
- studying biodegradability

2.) Previous work basically valid -
Done by Rosborough, Widmark, etc.

TRAN 057765

HARTOLDMON0039642

Pollution

Paul Hodges -
Plants
1.) Survey situation
2.) Stop any gross losses

Krummenich - was dumping
Thermical

Anniston HCL

Degradation -
Athens, Ga.
- Analysis for Chlorinated pesticides
- Federal water, pollution Cegetral Board

TRAN 057766

CHLORINATED BIPHENYLS

CHRONOLOGICAL EVENTS

11-22-66 - JENSEN LECTURE, DENVER-GREEN CENTER MEETING, STOCK-

12-15-66 Report of New Chemical Hazard - New Scientist Dec. '66
(Jensens Work)
First published report about PCB

12-29-66 Widmark letter to Monsanto
Head of Institute of Analytical Chemistry
University of Stockholm, Sweden
Found unknowns to be polychlorinated biphenyls
made by Monsanto, et al - used GC/Mass.
Sea eagle - 80 ppm polychlorinated biphenyls
- 80 ppm pesticides
- 40 ppm mercury
No knowledge of biological significance in living organisms.
Collaboration started with Dept. of Toxicology/Carolin Institute.
Would like to work with Monsanto Toxicologists on proble

1-10-67 Press Release, LKB Instrm. Co.
(Jensens Work)

1-26-67 D. Wood letter to Buchanan
Visited Sweden
Confirmed chlorinated biphenyl report of Jensen

1-30-67 Editorial in Chemical Engineering
Covers Jensens work

2-13-67 Wilds letter to Kelly

2-21-67 Hardy letter to Kelly
of - Jensen may have jumped gun in blaming chlorinated biphenyls

2-21-67 Kelly letter to Wilde - No need to contact Swedish people

2-27-67 Widmark letter to Wilde
Reviews lecture at Baeyer in Germany

2-27-67 Kelly letter to

3-16-67 Wilde letter to Kelly - Widmark Letter

5-67 S.A.O.A.C. - Pub. - Widmark 50 1069 (1967)

10-21-67 Holmes, Simmons, Tatton - Nature 216 227 (1967)
Confirms work of Jensen

PRR 021889
SCM 037311

11-1-67 Hardy letter to at
Status of work at ?

11-2-67 Richardson letter to Hardy
Confirmed by GC/Mass. Aroclor 1254 in eggs from 100 ppm feeding studies - confirmed Govt. Labs.

DEPOSITION EXHIBIT
PHS 281
6-11-92

E 419

12-30-67 Holden, Marsden - Nature 216 1274 (1967)
PCB in seals
PCB appears in birds with aquatic environment - suggests river contamination.
Human in UK contain little PCB <0.1 ppm in fat.
Suggests pollution is of aquatic origin - if air more would be found in human fat.
Conen found ∮ LD_{50} - unlikely that residues of PCB constitute direct toxic hazard.

1-8-68 Heininger letter to Robson/Anagnostopoulos.
Birdsall, Wisconsin Alumni Res. Foundation (WARF)
Studies to be on shore birds
Funded by U.S. Dept. of Interior, Fish & Wildlife Service
Suggested that Monsanto-WARF work openly

1-16-68 Wilson letter to Gentlemen/Monsanto
Res. Chemist, U.S. Dept. of Interior
Fish & Wildlife Service
Investigation of chlorinated polyphenyls in avian and animal tissues

1-26-68 Lincer letter to Patterson, MCL
Res. Assistant, Syracuse Univ. Res. Corp., New York
Wanted polychlorinated biphenyl references & materials

2-8-68 Spencer letter to Richard
Consultant, Nat. Ag. Chemicals Assoc-
Interferences with chlorinated hydrocarbons

2-13-68 Baxter letter to Richard - Ref. to Syracuse

2-19-68 Richard letter to Baxter - Aroclor 6A status

2-23-68 Hardy letter to Richard

4-26-68 Paton letter to Kelly

5-3-68 Newell letter to Hunt
Chairman Dept. of Ag. & Environmental Toxicology, Stanford Res. Institute
Toxicological results/birds & fish/enzyme induction stimulated
Recommended tests in cooperation with Monsanto rather than seek govt. support
Med. Dept. recommended no action.

5-6-68 Kelly memo to Robson/Anagnostopoulos - Reference to 5-3-68

5-20-68 Richard to Davis and back

5-23-68 Richard to Davis and back

PRR 021890

SCM 037312

HARTOLDMON0039645

7-15-68 Glasgow, Chief Pesticides - requested info on Aroclors
Ref. Stds. Section
Dept. Health, Education & Welfare
Blickenstaff - USDA - quality control for formulations
Dykstra - USDI - Pautuxent, Maryland Labs - Aroclor sent

7-31-68 Paton Memo

8-23-68 Wheeler to Early, trip plan

9-5-68 Wheeler plan memo for visits

9-11-68 Wheeler memo to Richard - Biotest Protocols

10-9-68 Risebrough - Confidential pre-publication
PCB in fish & birds
Comments from Monsanto solicited

10-21-68 Wheeler to Richard - Risebrough paper

11-1-68 Risebrough to Conkin - Publication Review

11-6-68 Wheeler to Richard

11-13-68 Conkin to Risebrough - Comments on review of manuscript

11-14-68 Wheeler memo to Richard

11-27-68 Paton to Richard
Include Aroclor 5460

11-68 Gunther - Prof. of Entomology & Chemistry, Univ. of Calif.
School of Ag. Sciences
Dept. of Entomology
Citrus Res. Ctr & Ag. Expt. Sta. - Riverside

State USDA Research Area
Committee including Hawaii
DDT & chlorinated hydrocarbons

12-3-68 Gunther to Paton - Request for Aroclor Sas.

12-9-68 Wheeler to Richard - Calendra Minutes

12-9-68 Richard to Wheeler - Calendra Minutes

12-14-68 Risebrough - Nature 220 1098 (1968)

12-19-68 Richard to Tucker - DDT, et al

12-20-68 Wheeler to Calendra - Letter of authorization

12-23-68 Bryant to Harris - Rome Pollution Laboratory

12-30-68 Richard to Kuhn - Legal problems

12-30-68 Tucker to Richard - Chlorinated Naphthalenes

SCM 037313

PRR 021891

HARTOLDMON0039646

12-31-68	Tucker ~~to Bucher~~ - Aroclor at Anniston
1-7-69	Wheeler to Richard - Aroclor Wildlife
1-9-69	Wheeler to Richard - Meeting
1-10-69	Wheeler to Calendra - Feeding of Halowaxes
1-16-69	Wheeler to Tucker - Widmark Paper
1-21-69	Wheeler to Fancher - Proceed with chickens
1-21-69	Wheeler to Richard - Pesticide Structures
1-23-69	Hodges to Buckley - Aroclors in Plant Effluents
1-24-69	Paton to Keller, et al - Montar
1-30-69	Tucker to Wood - Update
2-4-69	Wood to Tucker - Reply
2-7-69	Tucker to Wheeler - Pesticide Sas.
2-10-69	Wheeler to Fancher - DDT, et al sas.
2-24-69	Perlman - San Francisco Chronicle
2-25-69	Tucker to Keplinger
2-25-69	Tucker to Wheeler - Widmark's Paper
2-25-69	Tucker to Wheeler/Richard - Anniston River Results
2-26-69	Notes on meeting - Burgen, et al
2-26-69	Tucker to Stark - Solubility
2-28-69	Rough Draft - Keller - Position Statement
3-4-69	Tucker to Richard - Combustion
3-4-69	Wheeler to Wood - Dept. of Fish & Game
3-5-69	Paton to Richard - DDT on Trial

PRR 021892

SCM 037314

R. E. Kell
3/10/69

HARTOLDMON0039647

Mtg - 6/6
Aroclor Toxicity - f

EXHIBIT
PLF No. 933
10-8-92

1) Heller -
1. Scotland OECD - Studied DDT residues in fish.
Amount with 1 ppB can concentrate to 1 ppm in 6 wks - when gets to 2 ppm, trout dies - Possible that PCB goes through same concent. process.
He was concerned about PCB only because of interference.
2 Shell - dieldrin & other pesticides - protective
Ran 1 yr feeding tests on Ar 1254 - Found no effect at 100
Also interested because then use Aroclor in pet additives
3. Govt Chemists London - Shell & BP use 3% in Jet Engine Lubes
Found PCB as interference
" " occasionally in food & human tissues
Carcasses of birds show high levels of PCB
4. Jensen no longer with Analytical Institute - will be with Consumer
He will be the key man in pulling PCB together
5 Widmark - has paper Jensen presented to Nature for publication.
Think Jensen was premature - needs more examples before making conclusions.
DDT has been banned for 2 yrs -
Jensen made similar claims last yr about Pinto - May be
[illegible] offered to do away with Pinto in Sweden.
Pinto, next yr
1. No move to eliminate PCB
2. Much effort to pin down
Appears that lower chlorinated - 1242 & below - are not showing up
By their tests, they would see it if it were there.
Clophen 50 - same as 1254 - Widmark uses as standard
WRR conclusion - Sweden is going to ban 1254 - Clophen 50
The Poison Control Board doesn't have authority to ban [illegible]
pesticides - only drugs & pesticides.
6. Netherlands
Published paper in Nature confirming Jensen
Have seen ~~[illegible]~~ birds been extinct -
7. Bayer - Res & Medical - Have done much in last yr -
1. Check their own people
2 Fish toxicity studies
We don't want to work jointly until we have determined Aroclor toxicity
Memphis yet on plant treatment - [illegible] on stream in [illegible]

TRAN 022339

HARTOLDMON0039648

S. Progil - Completely in the dark
Jensen - Marine paint is prime source -

Wise.
Frances Coon - WARF - said PCB was the villain
California - State senate has voted a fold hearings on eliminating
DDT + chlorinated pesticides.
F G Plasticizer - Aroclor 5460
Fed Leg has been proposed on DDT
HEW is going to have a pesticide committee
15 States are taking action

Work done analytically is valid - Jensen, Wilmark, etc.
Mass spec. work was done only in Sweden + Holland - not
Risebrough or U.K.

Paul Hidgas

TRAN 022340

Legal Aid Toxicity
Jan - December
1969

(1)

8/25/69.

Aroclor Toxicity Mtg

Wheeler, Kelly, Kuhn, Richard, Tucker, Ed Jeby, Springate, Hosmer, Spano, HAB.

1) Joe Street — Utah State Univ
PCB — effect on liver
— as potent enzymes as DDT

attach "A" letter

2) Ga Health Dept (GA State Agric Dept)
PCB in milk report
FDA to give State Health (GA) anything we have.

3) Hartford, Conn. publicity
PCB in Fish

EXHIBIT
Plf. 552
8/14/92

4. Fague call report
Great Lakes Steel Corp.
report "1 ppm kill all marine organisms"
— we wrote back asking more info.

TRAN 021750

5.) Japanese — heat transfer leak.
rice bran oil (attach "B")

5 follow? Div advised by Wheeler re food contamination — check all customers be sure none come in contact
— originally felt taste would preclude.
—

HARTOLDMON0039650

2

I Fallon? // Can we get Kanechlor Design - that cause rice bran oil problem - Find out why it happened?

Kellog, Battle Creek called Wheeler - they have new plant in Japan - said they might have to review.

6) A Govt Lab Ann Arbor, Mich - talking to Water Pollution Duluth, Min

Sample Electrosol - found:

5 ppm PCB

Scott Tucker found 4 out of 5 had PCB

7) WARF - Study Lake Michigan

Sponsored by Volsicol, Shell, Stauffer, etc.

Found 9 out of 80 samples ~~[illegible]~~ These are H_2O samples. Trying to find sources DDT, Deldrin etc.

Found PCB

Sheboygan Rec

Found PCB - say its 1254

no quantitative yet - want to talk technique to us.

TRAN 021751

HARTOLDMON0039651

Monsanto

(8) Pensacola situation

- Attach 'C'

- meeting with State people.
  State people didn't ask searching questions

- sample mud - 1/4 mile below our outfall
  found 486 ppm

- Pensacola will monitor own outfall working
  with Tucker.

(9) Publicity from Oregon State - attach "D"

Biological Impact

Anacapa Island - Brown Pelican
Anchovies - hundreds of ppm - not confirmed by
mass spec.

1 monsanto did not provide isomers

- Paper by Reynolds -
  1×10^{10} gr product 22 at lbs/yr. by mass
  mass all living organisms on earth
  leads to
  PCB residues in fish - if FDA ever look
  ~~that~~ they'd rule out.

TRAN 021752

HARTOLDMON0039652

10) Scott Tucker – memo 8/18/69

USDA Committee mtg W-45 – St L. Oct 15-17.
attach "E"

11) Our Tests
Chronic 90 day
no effect rats & dogs
1 aroclor – 100 ppm – some decrease thickness
leghorn chickens

Conclusion

Committee apld.
Elmer Wheeler – Chm
Bill Richard
Martin Farran
Ed John / Tom Ford

Rept by 9/15 – recommendations on future program

TRAN 021753