

1 A If the levels are high enough, yes, I do.

2 Q What level, in your view, passes that threshold?

3 A I don't know.

4 Q What's your basis for believing that there is a  
5 threshold at which that exposure can become harmful?

6 A Well, basically the evidence. Most of it probably  
7 stems from the work that I came across with animal  
8 exposures over the years. Humans are not terribly  
9 unlike other mammals in their response to certain  
10 chemicals. Some species are simply more sensitive to  
11 certain chemicals than others.

12 Q You're not aware of any studies on human beings which  
13 demonstrate that correlation, are you?

14 A I can't cite you one, no.

15 Q Well, you say you can't cite me one. Have you read one  
16 and you just can't remember the citation for it?

17 A I have seen claims of abnormal cell structures, whether  
18 they call them cancer or precancer, based upon PCB  
19 exposure, I'm fairly sure. I can't cite that. I have  
20 sat and heard this issue argued.

21 Q At environmental levels?

22 A Depends upon what you call an environmental level.

23 Q Well, I thought we understood what that was because

1       you've answered a number of questions using that term.  
2       I'm referring to exposures to levels that are generally  
3       found in the environment as distinguished from an  
4       exposure such as the Yusho incident or occupational  
5       exposures?

6               MR. McCREA: Jan, I don't think that  
7       question is capable of being answered because obviously  
8       you have different levels within the environment.

9               MR. FELDMAN: Well, we've tried to discuss  
10      the issue of the threshold. I mean it's part of the  
11      same question.

12              MR. McCREA: I don't mind the question.  
13      But to me it's irrelevant to the case because general  
14      environmental levels simply are not something that can  
15      relate to a specific situation.

16              MR. FELDMAN: Can I have my question back?

17              (The Reporter complied with Counsel's request and  
18      read as directed.)

19   A      I thought the question we were haggling over had to do  
20      environmental levels was in the statement somewhere.

21   Q      That's all right. It's impossible to dredge it out.

22              Are you aware of any studies that correlate exposure to  
23      environmental levels of PCBs with cancer?

1 A By environmental levels I'm assuming you mean part per  
2 billion or part per trillion levels. I'm not aware of  
3 one, bearing in mind that I have not reviewed the  
4 literature in more than 10 years.

5 Q Okay. Are you aware of the current levels of PCBs in  
6 the water flowing through Conard's Branch?

7 Let's do it in terms of a range. Are you aware of  
8 the range of levels of PCBs in the water in Conard's  
9 Branch?

10 A That number may have been flown by me sometime in the  
11 last three or four months. I don't remember what it  
12 is.

13 Q Whatever that number is, are you aware of any studies  
14 that have correlated exposure to such levels of PCBs in  
15 water with any kind of illness or disease other than  
16 psychological?

17 A I'm not aware of a study that's done that, no, whatever  
18 the level.

19 Q And have you looked for such a study?

20 A No, I haven't.

21 Q Has Mr. McCrea provided you with anything like that?

22 A Mr. McCrea has provided me with what's here. And I  
23 don't believe there is such a study in there.

1 Q So, the answer is no?

2 A Yes.

3 (A recess was taken during which time Defendant's  
4 Deposition Exhibit 22 was marked for identification.)

5 Q Doctor, we have just had a discussion off the record  
6 about your -- What do you call them? Daily record  
7 books?

8 A Yes, that's what I call them. Westinghouse calls them  
9 engineering notebooks.

10 Q All right. And some of which or maybe all of which  
11 were requested in a production request that we received  
12 in this case. And I provided to Mr. McCrea at your  
13 last deposition the portions of those materials that we  
14 had that we identified as being relevant to or  
15 potentially being relevant to the Bloomington  
16 situation.

17 And now the court reporter has just marked and I'm  
18 showing you your Deposition Exhibit No. 22 which is a  
19 copy of the materials that we provided to you at the  
20 last deposition. I assume all that is your writing; is  
21 that right?

22 A No.

23 Q Who contributed to the materials that you have before



1       you?

2   A    I don't recall exactly whose writing this is. The bulk  
3       of the pages here that have numbers under a column  
4       called sample number, these are entries in a record  
5       book that was used primarily for recording the  
6       existence of a sample. The fact that a sample had been  
7       taken and this might be what you would call a sample  
8       logbook where the sample that was taken was logged into  
9       the laboratory system for subsequent analysis.

10       This handwriting would be the handwriting of  
11       whichever one of the technicians was given the job of  
12       logging in that particular group of samples. If you  
13       can imagine them arriving in the laboratory like in a  
14       big cardboard box or whatever container they came in  
15       from the field.

16   Q    Are there other cloth-bound books other than these  
17       which contain the activities of T. O. Munson?

18   A    Absolutely.

19   Q    Other than the books from which Exhibit 22 was taken  
20       are there other activity books?

21   A    Very definitely.

22   Q    In other words, there is a completely different kind of  
23       log other than the ones that are excerpted as Exhibit

1 22; is that right?

2 A Yes. Same physical type of book, the Westinghouse  
3 engineering notebook. But I and each of the persons  
4 who worked for me kept a personal daily journal. So,  
5 each day that you were in the laboratory you did some  
6 work there would be an entry date, there would be a  
7 narrative. My instructions to them was to make the  
8 narrative clear enough that someone else could  
9 interpret your work if you weren't around to interpret  
10 it. So, it looks like a journal.

11 And my guess is I had -- I don't know -- at least  
12 five, maybe as many as ten, of those that I generated  
13 during the time I worked for Westinghouse. In  
14 addition, the people who worked in the laboratory with  
15 me -- I think we called out their names before -- Jerry  
16 Tassler, T-a-s-s-l-e-r. Mary Salb, S-a-l-b, Bethany  
17 Johnson, Donna DiSpirioto, D-i-S-p-i-r-i-t-o, they  
18 would have generated some notebooks as well. If they  
19 were analyzing a Bloomington sample, then that would be  
20 in their notebook.

21 To complete this comment about the evidence, I  
22 believe the final page is from a different notebook.  
23 There is something about a swan. It has nothing to do

1 with Bloomington. Signed by Jerry Tassler. The entry  
2 up above is in somebody else's handwriting but not  
3 mine. I think there's a page number that makes it  
4 clear that it's not from the same book as the preceding  
5 pages.

6 Q I did not mean to represent to you that this was all  
7 taken from the same book.

8 A Yes, I understand that. I was making that clear.

9 Q Very briefly, is there anything here in your  
10 handwriting?

11 All I want is a yes or no, and we'll come back to  
12 it later.

13 A Yes.

14 Q Can you identify it in any way with the sample numbers?

15 A On page 21 the entry for starting sample No. 141, that  
16 is my handwriting. It continues through 142, 143,

17 across the next page to 155. Part of that entry is my  
18 handwriting. Part of it is someone else's

19 Q We'll come back to it later. I just wanted to see if  
20 there was anything in there that was yours. And you've  
21 answered that question.

22 At or about the time you started doing the  
23 sampling project in 1970 or '71 did you make a search

1 of the literature to determine the kinds of  
2 applications that PCBs had been used in up to that  
3 time?

4 A I had several articles talking about that subject. I  
5 don't recall if I exhaustively searched the literature.

6 Q You read something about it, though?

7 A Yes.

8 Q Did you do any independent investigation to determine  
9 the kind of applications that PCBs had been used for  
10 prior to the time you started the project?

11 A I don't remember doing more than collecting the  
12 available articles on PCBs. Probably most of them were  
13 written from the point of view of environmental levels  
14 that were being seen.

15 Q You don't disagree with the position that PCBs were  
16 used in plasticizers, hydraulic fluids, lubricants,  
17 surface coatings, inks, adhesives, pesticide extenders,  
18 and carbonless copy paper, do you?

19 A It is my understanding they were used in those  
20 applications.

21 Q Is it also your understanding in their use in those  
22 applications human contact with PCBs would have been  
23 relatively commonplace?

1 A Yes.

2 Q Is it also your understanding that as a result of those  
3 uses that PCBs would be distributed ubiquitously into  
4 the environment?

5 A Yes.

6 Q Have you ever reviewed any literature on the tendency  
7 of PCBs to adhere to soil?

8 A I have read articles to that extent, yes.

9 Q Do you agree with the position that PCBs are less  
10 likely to move in soil than other fluids because of  
11 their tendency to adhere to soil?

12 A Yes.

13 Q Is it your understanding that that propensity for PCBs  
14 to adhere to soil was one of the reasons industry  
15 disposed of PCBs into landfills prior to the early  
16 '70s?

17 A I believe that's true.

18 Q And is it your understanding that the reason that  
19 industry used landfills to dispose of PCBs was because  
20 their tendency to adhere to soil would make them less  
21 likely to migrate out of the landfills?

22 A I believe that's the reason, yes.

23 (Defendant's Deposition Exhibit 23 was marked for

1 identification.)

2 Q Dr. Munson, I'm going to show you a document we've just  
3 marked as your Exhibit No. 23 and ask you if you can  
4 identify what that is for us.

5 A This looks like a proposal to the Environmental  
6 Protection Agency.

7 Q Let me ask you a background question. Have you seen  
8 this document before today?

9 A Seen when?

10 Q At any time.

11 A I presume I must have written it since my name is in  
12 the top right-hand corner. It says 18 May, 1971.

13 Q Do you recall drafting Exhibit 23?

14 A I sure don't.

15 Q So, is it fair to say that you don't have any current  
16 recollection of how this document came to be?

17 A All I can say to that is that as part of our seeking  
18 for outside funds at the Ocean Research Laboratory --  
19 We were only partially supported by Westinghouse --  
20 many such preliminary proposals were generated by  
21 myself and others. I think we called this a KISS, keep  
22 it simple, stupid.

23 And this, then, was taken by one of our marketing

1 people who would then pound on doors in various  
2 government agencies seeing if he could generate some  
3 interest. That's why this was called a preliminary  
4 proposal.

5 Q All right. It is not the case, then, is it, that the  
6 project that ultimately led to the sampling you did in  
7 Bloomington and other plants in '71 began as a  
8 preliminary proposal to the EPA?

9 A I really don't know how this relates.

10 Q You do, though, still believe that this is something  
11 that you drafted?

12 A Oh, yes, I think without doubt I drafted this.

13 Q Looking on the second page of the document --

14 MR. McCREA: Do you have a third copy?

15 MR. FELDMAN: I don't. Sorry, David. I  
16 apologize for that.

17 Q Looking on the second page under the heading  
18 introduction you indicated that as of the day of this  
19 article in May of '71 there was a paucity of chronic  
20 toxicity.

21 What did you mean by that, if you recall?

22 See that at the end of the first paragraph?

23 A Yes. Basically that statement says that at that

1 time -- I'm citing essentially a statement made by  
2 Gustafson in 1970; that's the reference -- that at that  
3 time there was not enough chronic toxicity data to  
4 assess the environmental impact. That was my opinion  
5 at that time.

6 Q What did you mean by chronic toxicity data?

7 Does that refer to the effects on humans of low  
8 level exposure to PCBs over a period of time?

9 A I don't think I was particularly aiming this at humans.

10 Q Would that be included in that statement?

11 A Sure. I'm essentially when I say environmental impact  
12 I'm talking about all living beings or all living  
13 animals, I should say. In fact, I shouldn't limit it  
14 to animals. All living organisms. Because impact on  
15 plant life, particularly phytoplankton in the ocean,  
16 can be critical.

17 Q Is it fair to say, then, viewed in that comprehensive  
18 way your statement at that time in 1971 indicated that  
19 there was a lack of data as to the adverse effects on  
20 all those kinds of organisms from chronic environmental  
21 exposures to PCBs?

22 A Yes. The statement is there was not enough chronic  
23 toxicity to make assessment of the impact really



1 reliable, I guess. The word I use here is it was  
2 difficult to make an assessment at that time.

3 Q Looking at the next page, at the end of the first full  
4 paragraph on that page the statement reads: The  
5 primary objective of the study will be to evaluate the  
6 amount of release to the environment from the  
7 manufacture, use and disposal of PCB containing  
8 transformers and capacitors.

9 Is it fair to say as of the date that that you  
10 drafted this proposal in May of '71 that there was  
11 insufficient data to evaluate the amount of release to  
12 the environment from those activities?

13 A It was my opinion that the data in the open literature  
14 needed to be added to. The one thing you do have to  
15 remember when we read a document like this is this is  
16 like a sales brochure for a car. One tends to make  
17 one's case fairly strongly. Now, I don't recall  
18 reading this at the time. Pardon me. I mean I don't  
19 remember writing this. And it's hard to project myself  
20 back into 1971 when I wrote this. But I think one  
21 needs to bear that in mind when pulling the sentence  
22 out of here.

23 Q So, as I take it, what you're saying is one of the

1 motivations in this report and in reports like this is  
2 to obtain funding for additional studies?

3 A Certainly.

4 Q And that that motivation leads to, what shall we call  
5 it, salesmanship or puffing of some of the problems  
6 that might exist?

7 A Yes. I would like to think that I would not ever put  
8 anything that was not true down here. But on the other  
9 hand, you tend to pitch it strongly hoping to elicit a  
10 response.

11 Q Is it true that you tend to emphasize concerns that  
12 might exist in the data?

13 A Certainly.

14 Q Now, looking at the next page, page 3, at the bottom  
15 and then proceeding on to the next page there is a  
16 reference to the approval or the assurance from the  
17 highest corporate levels that it's in the best long-  
18 term interests of Westinghouse Electric Corporation to  
19 conduct such a study with complete objectivity and "let  
20 the chips fall where they may."

21 Is the quote "let the chips fall where they may" a  
22 direct quote from some individual?

23 It may be that you just don't remember it, and I

1 don't want you to speculate about it.

2 A Well, basically in essence I recall that as being the  
3 sentiment of Don Burnham, the chairman of the board,  
4 when I spoke with him. Whether he actually said those  
5 exact words, I'm not sure. But basically that was his  
6 sentiment.

7 Q When you say you recall that as being the sentiment, I  
8 understand that to mean that Mr. Burnham on behalf of  
9 Westinghouse was interested in obtaining all of the  
10 facts, even if they were adverse to Westinghouse; is  
11 that correct?

12 A Yes. And I should say I believe that was his publicly-  
13 stated position. Maybe that's a little stronger than  
14 sentiment. I believe he was on record somewhere as to  
15 saying that about environmental effects from company  
16 operations.

17 Q Okay. At the bottom of 3 again when you refer to the  
18 highest corporate levels are you specifically  
19 referring, if you remember, to Mr. Burnham or to other  
20 individuals as well?

21 A I can't remember. I'm saying in this paragraph that  
22 the director -- That would be John Kelly -- obtained  
23 these assurances. I wish I could remember exactly

1       because one of the things that's puzzled me is exactly  
2       what date I had that conversation with Don Burnham.  
3       And I don't remember.

4   Q   On page 5 under information gathering, item 1.4 refers  
5       to an evaluation of the consequences of a partial or  
6       complete ban on PCB use. Do you have any recollection  
7       as to what kind of consequences this proposal was  
8       proposing to analyze?

9   A   We were thinking from the point of view of the  
10       electrical industry. There is a lot of concern in the  
11       electrical industry about okay, if we stop using PCBs  
12       today, what's going to fill that niche to provide the  
13       right fluid characteristics, right insulating  
14       characteristics and nonflammability.

15   Q   Was one of the concerns that without the use of PCBs in  
16       capacitors and transformers there would be a  
17       significantly greater incidence of fire and explosion  
18       from that kind of equipment?

19   A   I know those kind of statements were made.

20   Q   Is it your understanding that PCBs reduced the number  
21       and severity of fires that resulted from capacitors?

22   A   That was my understanding, yes.

23   Q   Do you have any reason to still believe that?

1 A No, I don't.

2 Q Is it your understanding that fire codes and in some  
3 indications electrical codes and insurance codes  
4 frequently required the use of PCBs in certain kinds of  
5 electrical equipment?

6 A I was told that schools, shopping centers frequently  
7 required the nonflammable type transformers and  
8 capacitors, yes.

9 Q Meaning PCB --

10 A At that time that was PCB-containing transformers and  
11 capacitors.

12 Q And the reason for those requirements was because  
13 capacitors and transformers that use straight mineral  
14 oil as opposed to PCB fluid had a higher tendency to  
15 cause fires and explosions; is that correct?

16 A That's my understanding. Once again, we're in an area  
17 that I don't claim a lot of expertise.

18 Q I take it you've never reviewed any of the literature  
19 on the advantages of PCB fluids in capacitors and  
20 transformers?

21 A I've read several of the documents that were produced  
22 by the electrical industry, yes, I have.

23 Q Produced in the mid '70s?

1 A I think they were, yes.

2 Q Have you done a search for that recently?

3 A No.

4 Q Was Exhibit 23 ever actually sent to the Environmental  
5 Protection Agency?

6 A I don't know the answer to that question. I had  
7 totally forgotten about this document until you put it  
8 on the table a few minutes ago. But you've stirred the  
9 pot a little bit in my brain. And I think if I am  
10 remembering right, this may have been something that  
11 John Kelly and I put together to use as a goad to  
12 generate internal funding for that program, to put  
13 something in writing which could then be put up through  
14 channels for approval.

15 Don Burnham's open-handed honesty notwithstanding,  
16 a lot of the more practical people were not very happy  
17 about such data being generated. They felt that as  
18 soon as data was generated showing problems, that was  
19 potential exposure for plants, manufacturing plants,  
20 that could create inflammatory situations.

21 Q Why did Exhibit 23 address concerns such as the ones  
22 you've just stated?

23 A I beg your pardon. Why did it address what?

1 Q How did Exhibit 23 serve to either alleviate or I guess  
2 make irrelevant the kind of concerns that you just  
3 discussed?

4 A Well, Exhibit 23 is essentially my proposal in which I  
5 have through the introduction have made an assessment  
6 of the PCB situation at that time and made a case for  
7 the fact that we need to do the type of study that's  
8 proposed in here. As soon as this document was  
9 generated by me as a preliminary proposal for  
10 estimation to the EPA the next step then would be for  
11 it to go up through channels to get approval for being  
12 passed out.

13 If I had to guess, and I'm still not -- I don't  
14 have a memory of it. If I had to guess, I would guess  
15 this document was never sent to EPA.

16 Q But that's just speculation; is that correct?

17 A That's my speculation, yes. That's my speculation that  
18 subsequent to this a formal program was generated.

19 Although, that may not be right. I'm looking at the

20 date of 18 May, 1971. I may already have gone to

21 Sharon, Pennsylvania, by that date. So, I don't know.

22 As I said, I had totally forgotten about that document.

23 Q Okay. And you're having trouble recalling the details

1       surrounding that document?

2   A    Yes.

3   Q    You have indicated in one of the documents that you  
4       prepared for Mr. McCrea that were introduced as  
5       exhibits last time that you first learned about PCBs in  
6       1970 sometime; is that correct?

7       You can refer to the document. It's Exhibit 9.

8   A    It was either late '69 -- I started doing pesticide  
9       work in either late '69 or early '70 in San Diego. And  
10      it was subsequent to that that I learned about PCBs.

11   Q    And the context of your learning about PCBs in doing  
12      pesticide work, as I understand it, was the realization  
13      that in some of the analytical data looking for  
14      pesticides it was learned that PCBs might be  
15      interfering with the laboratory results?

16   A    That's correct.

17   Q    Is it fair to say that the publication of literature on  
18      that phenomenon occurred sometime in the late '60s?

19   A    Yes.

20   Q    And prior to that time it was not known as to whether  
21      PCBs might be appearing in the environment in the kinds  
22      of samples that they were testing?

23   A    I believe that's true. I think the late '60s were the



1 first published accounts.

2 Q And you said you looked at some data generated by  
3 scientists in Sweden; isn't that correct?

4 A I think so, yes.

5 Q I take it that if the discovery that there were levels  
6 of PCBs in the environment as disclosed by the  
7 scientists in Sweden wasn't discovered until the late  
8 '60s there also wasn't any published literature on  
9 possible health effects either to animal or human from  
10 environmental exposures during that period; is that  
11 right?

12 A Well, I don't know. I hadn't seen any. But PCBs were  
13 being used in very large quantity. Someone may have  
14 done some -- I would guess there surely had been people  
15 who had suffered from chloracne through use.

16 Q Again, I'm referring to environmental exposures.

17 A I would guess you're probably right.

18 Q I don't want you to guess. You just don't know of  
19 anything to disclose that?

20 A No. I didn't even know of PCBs before 1968 or '69.  
21 I'm sorry.

22 Q In your August 6th, 1988 summary to Mr. McCrea you  
23 indicate that in the fall, September and October, of

1 1970 the U. S. scientific community was beginning to  
2 pressure the U. S. government to regulate the use of  
3 PCBs.

4 What specifically is your basis for that  
5 statement?

6 A My recollection of -- Just my recollection of what the  
7 situation was at the time. I don't remember what  
8 meeting I had gone to where I had heard this discussed.  
9 There were a number of meetings I went to where  
10 government people were present and university people  
11 were present talking about pesticides in the  
12 environment and PCBs in the environment.

13 Q Apart from those meetings, you can't recall any  
14 specific detail of pressure exerted by the scientific  
15 community to have the U. S. government regulate PCB  
16 use?

17 A No. Robert Risebrough at Berkeley at the time was  
18 being very vocal about PCBs and levels in the  
19 environment and was making very alarming statements at  
20 the time about PCB use and detrimental effects and that  
21 sort of thing.

22 Q You say that during that period you were shaken to  
23 think that you might be working for one of the black

1       hat corporations who were raping the environment in  
2       pursuit of the almighty buck.

3               What was the basis for that concern at that time?

4               MR. YOUNG:   When was it?

5               MR. FELDMAN:   He's unable to better fix  
6       the time than late '70s.

7   A       My basis for that was when I discovered -- I had been  
8       hearing -- You have to remember this was a time after  
9       Rachel Carson wrote Silent Spring. Do you remember the  
10      date? Sometime in the '60s or something. It was when  
11      certain folks were beginning to predict our doom.  
12      That's what Silent Spring is all about, first the birds  
13      and then the humans because of what we were doing in  
14      the environment.

15              There was not a tremendous amount of regulation of  
16      industrial effluents going on. I was a flag-waving  
17      environmentalist at that time and young and idealistic.  
18      And I discovered one day that after I had learned about  
19      PCBs I had read some of the material, and PCBs at that  
20      time sounded as though they presented the same threat  
21      as DDT, which was fairly well recognized by those who  
22      were paying attention at the time as quite a threat.

23              And then you can imagine my shock when I

1 discovered that Westinghouse was using, if I remember  
2 the numbers, millions of pounds a year of the stuff in  
3 its manufacture of transformers and capacitors.

4 Q Is it fair to say that that concern that Westinghouse's  
5 use of PCBs might be "raping the environment" was part  
6 of your motivation in doing the study in Bloomington?

7 A Sure.

8 Q You indicated earlier that at least to some extent you  
9 had pitched Exhibit 23 in a way that would prompt  
10 people to want to fund the project that you were  
11 proposing; is that correct?

12 A Yes.

13 Q Is it fair to say that the drafting of what ultimately  
14 became the report for the Bloomington area was pitched  
15 in the same way?

16 A Perhaps to a certain extent, yes.

17 Q And you understood at the time that you wrote the  
18 Bloomington report that the continued funding of that  
19 kind of a project was subject to competition from other  
20 projects; is that right?

21 A Yes. Although, I felt it had enough priority. I  
22 expected that project to continue. I was surprised it  
23 did not.

1 Q But you understood at that time that if you had  
2 conducted your investigations and samplings and so on  
3 and determined there was not a significant problem in  
4 the Bloomington area that future funding for that  
5 project would likely be cut off?

6 THE WITNESS: Would you read that question  
7 again.

8 (The Reporter complied with the witness's request  
9 and read as directed.)

10 A We were essentially seeking an answer to the question  
11 was there leakage to the environment or not and how  
12 much and what might be done about it. Basically I felt  
13 the project was going to continue until we answered  
14 those questions. I felt like we were seeking for the  
15 truth. And I believe the truth is what I put in that  
16 report.

17 Q That doesn't really answer my question.

18 A I understand that.

19 Q Is it fair to say that you understood when you drafted  
20 the Bloomington report -- Let me get it into the  
21 record.

22 (Defendant's Deposition Exhibit 24 was marked for  
23 identification.)

1 Q Is Exhibit 24 that the court reporter has just marked a  
2 copy of the report that ultimately was generated from  
3 your sampling in the Bloomington area?

4 A It looks like it. The only thing that's missing is all  
5 of the copies of the report that I generated had a big  
6 red inked company proprietary class 1 label stamped on  
7 them. I stamped them all personally myself.

8 Q Apart from that difference, is that a true and correct  
9 copy of the report that you generated from the sampling  
10 in Bloomington?

11 A Well, true and correct, I don't have an original, but  
12 it looks like the report. Okay. I've seen only copies  
13 of it and not since -- Well, I believe I was shown a  
14 copy by Eric Ordway in New York. When was that. Last  
15 year. And then again by David recently. But I have  
16 not seen an original in the ensuing however many years  
17 that is, 15 or more. But this looks to me like a true  
18 and correct copy of the original report, yes.

19 Q Now, back to my original question, you understood when  
20 you drafted Exhibit 24 that if your conclusions were  
21 that there was not a problem disclosed by your sampling  
22 and research in Bloomington that there would likely be  
23 no additional funding for further sampling and analysis

1 in Bloomington; isn't that correct?

2 A Yes, in Bloomington. My understanding was we would  
3 then proceed with the survey to the other sites, the  
4 repair facilities, to complete the survey of the  
5 possible environmental impact by Westinghouse's use of  
6 PCBs. There would have been no further reason to  
7 sample at Bloomington had we found no problem.

8 Q And if subsequent sampling at other sites disclosed no  
9 problem, then eventually the entire project would come  
10 to an end rather than generate additional funding;  
11 isn't that correct?

12 A Yes.

13 Q Do you know the date that Exhibit 24 was actually  
14 finalized and sent to its addressees?

15 A No, I don't. I don't think there is a date on it. I'm  
16 at a bit of a disadvantage because I don't have any of  
17 this material anymore.

18 Q I have some recollection of your questioning whether  
19 there were more pages beyond some document or some copy  
20 of Exhibit 24 that you were shown on a prior occasion.

21 Are you satisfied as you sit here today that page  
22 15 is as high as it went?

23 A I think it is.

1 Q Did you have an office in Bloomington that you worked  
2 out of?

3 A No.

4 Q Everything was done from the plant?

5 A Or motel rooms.

6 Q Who else was involved in the work that you did in  
7 Bloomington?

8 Let me break that down. Who else was involved in  
9 actual collection of samples?

10 A Okay. I'm trying to remember the names. I believe on  
11 one sampling trip a fellow named Sam Stearns,  
12 S-t-e-a-r-n-s, drove with me in a truck pulling a  
13 trailer with a boat on it to Bloomington. And he and I  
14 did some sampling. On another occasion I believe I did  
15 some sampling with a fellow named Karl Armour. I think  
16 that's A-r-m-o-u-r. He was from the environmental  
17 systems division, same group where J.G. Terrill worked,  
18 T-e-r-r-i-l-l, shown on Exhibit 24.

19 Q Basically a group of three?

20 A Stearns and I came by ourselves on one trip. Another  
21 trip there -- There may have been three of us. Another  
22 person may have been Mr. Gray, G-r-a-y, Lyons,  
23 L-y-o-n-s, as the support technician I brought with me



1 from our organization. And I believe at that trip we  
2 met up with Mr. Armour, and I believe the three of us  
3 sampled at that time. In addition, samples were  
4 collected by Lew Shoaff, S-h-o-a-f-f, I think, from  
5 Bloomington and sent to me. That's Mr. J.L. Shoaff I  
6 see on this.

7 Those are the only people I recall from outside  
8 Bloomington who were involved in the sampling.

9 Q Mr. Shoaff was in Bloomington?

10 A Yes, he worked at Bloomington, I guess. I don't know.  
11 Maybe he still works at Bloomington.

12 Q Before you started doing sampling in the area did you  
13 have a meeting with individuals at the Bloomington  
14 plant?

15 A Yes.

16 Q What was the first meeting that you had with people in  
17 Bloomington?

18 A What date?

19 Q Well, if you can give me the date and also who the  
20 participants were.

21 A Oh, that will be tough. I may have tried to  
22 reconstruct that date in one of the documents that I  
23 provided for David.

1 Q Why don't you tell me who the participants in the  
2 meeting were and where it took place.

3 A Well, I believe at that meeting Mr. Brittain was there,  
4 J.B. Brittain, I believe Mr. McCrea was there and Mr.  
5 Shoaff.

6 Q And did that take place at the Bloomington plant?

7 A Yes. Now, at some point Don Sauter, S-a-u-t-e-r, I  
8 think, also was at the meeting, but I don't recall  
9 whether he was at that time. I'm sure that on a number  
10 of occasions I met with Brittain, McCrea, Shoaff and I  
11 believe Mr. Sauter as well.

12 Q When you say a number of occasions you mean throughout  
13 the course of this sampling project?

14 A Yes.

15 Q Now, at that first meeting what was the subject of the  
16 meeting? What was discussed?

17 A I told them about the survey that I was going to  
18 perform.

19 Q To your knowledge, had anyone called up or written or  
20 had you yourself done that prior to your arriving in  
21 Bloomington?

22 A I certainly must have called them and set up the  
23 meeting. But I didn't know at the time that they had

1        been contacted by someone else. I subsequently just  
2        recently through David saw a memo that came to them  
3        from somebody at Sharon. Because I had already been to  
4        Sharon telling them that I would be coming.

5        Q        Was that a memo written by Don McClain?

6        A        I don't remember. I believe it should be in this book.

7        Q        Let's leave that alone for the moment. We don't need  
8        to look for it. How long after this first meeting did  
9        you actually begin conducting sampling?

10      A        I think it was shortly -- it was within a month or so,  
11      I believe.

12      Q        Were you working on the Bloomington project  
13      continuously from the time of that first meeting until  
14      you started doing sampling?

15      A        No. All I would have done is plan the sampling. But  
16      we were doing other things at the same time. I already  
17      had visited Sharon. So, I was planning to sample  
18      Sharon. In fact, we may have actually sampled South  
19      Boston before we went to Bloomington. I don't  
20      remember.

21      Q        In any event, you had an initial meeting with the  
22      individuals you've mentioned at the plant and then  
23      began to plan out the sampling program; is that right?

1 A Yes.

2 Q Did you plan out the sampling program in coordination  
3 with any individuals at the plant?

4 A Yes.

5 Q Did you ask them questions about where samples should  
6 be taken?

7 A Yes.

8 Q And who did you ask those questions of?

9 A The person I worked with most closely through this from  
10 the point of view of sampling was Mr. Shoaff. I  
11 believe he was responsible for the disposal of the  
12 waste that left the plant and was trucked away. So, he  
13 showed me where the landfills were to be sampled.

14 Q Other than maybe your work books were there any notes  
15 or maps drawn up to show where the sampling sites would  
16 be?

17 A This page, figure 6, it says movement to Stout Creek, I  
18 believe that is a Xerox, a poor one, of a map I was  
19 using, the U. S. geological survey topographical maps.  
20 I think they're called the seven and a half minute  
21 quadrant maps. I had them that covered the entire area  
22 that Mr. Shoaff indicated where the landfills were. I  
23 had the maps that covered the area around the plant.

1           Using these maps I could project where stream flow  
2           would be if there were streams or where runoff would be  
3           if there were rain. And using those I decided where to  
4           take the samples. But that information was then  
5           transferred into the notebooks. In fact, I think even  
6           the maps themselves were cut out and pasted into the  
7           notebooks.

8   Q       What about the sampling around the plant?

9           Was that done in conjunction with someone at the  
10          plant?

11   A       Yes.

12   Q       Did someone tell you where you should sample?

13   A       They gave me some information like suggesting I sample  
14          by the tank car because they knew there had been some  
15          spills. As far as away from the immediate area around  
16          the plant, I then used what I judged to be the flow  
17          patterns for surface runoff and took the appropriate  
18          samples.

19   Q       At any time before Exhibit 24 ultimately was completed  
20          did you submit drafts or portions of Exhibit 24 to  
21          anyone?

22   A       I don't think so.

23   Q       Can you recall anything about discussions you had with

1 Don McCrea concerning this project?

2 A No, I don't think so.

3 Q Can you recall any conversations that you had with  
4 Robert Sawyer about the project?

5 A No, I don't.

6 Q Can you recall any conversations you had with Mr.  
7 Sauter about the project?

8 A I don't remember any conversations with him.

9 Q Can you recall any conversations you had with Mr.  
10 Brittain?

11 A I do remember a conversation with Mr. Brittain. And  
12 that was -- I can't remember. I think he took me out  
13 to lunch somewhere. And we were sitting at the table.  
14 And I was telling him that one of the samples I wanted  
15 to take but I was told I had better not take it is the  
16 sample of the sewage treatment plant. Because it was  
17 clear from the operation at the time there was a PCB  
18 containing effluent going into the sewage system that  
19 then went to the sewage treatment plant on that side of  
20 town.

21 And after I had done the sampling in the  
22 discussion I had with Mr. Brittain I told him that, you  
23 know, that effluent should be processed in such a way

1 to strip the PCBs out of it, that that could easily be  
2 done. I mean the engineering existed to do that.

3 Q Let me interrupt you for just a second. You mentioned  
4 that somebody told you not to do some kind of sampling.  
5 Was this before this conversation with Mr. Brittain or  
6 during or after?

7 A That was before this conversation. This conversation  
8 was taking place after I had finished the report. I  
9 hand carried the report to them and we sat down and  
10 discussed it.

11 Q And subsequently had a lunch with Mr. Brittain?

12 A I had a lunch with Mr. Brittain.

13 Q Was that shortly after the report had been issued?

14 A Yes, I believe it was at the same time I gave them the  
15 report.

16 Q Who was it that told you samples should not be taken of  
17 the Winston-Thomas plant?

18 A The structure of the thing at the time I was thinking  
19 Brittain was manager of the plant. And he really  
20 wasn't. Sauter was in on the front end and he stepped  
21 back. And it was then handled by Brittain, McClain,  
22 Shoaff, Sawyer working with me and they sort of worked  
23 like a committee. A lot of these discussions we sat

1 down around a table. Because part of the ground rules  
2 for this survey was that I didn't go out and take any  
3 samples before I had explained to the people what I had  
4 in mind. And this was true of all of the locations  
5 that I sampled.

6 Q Dr. Munson, I'm just trying to determine who told you  
7 that.

8 A I don't know. It would have been one of those three.  
9 Brittain, McClain, Shoaff, or Sawyer.

10 Q Can you tell me anything about the circumstances  
11 surrounding that statement, where it was said, when it  
12 was said, who else was present, the words that were  
13 spoken?

14 A I can tell you my understanding of why they didn't want  
15 me to sample it.

16 Q Is that all you can tell me about the circumstances  
17 surrounding that statement?

18 A Well, it would have been before this report before I  
19 took the samples on the first sampling expedition,  
20 whatever date that was. But other than that, I just  
21 don't remember. I just know that I wanted to take  
22 samples in the plant and wasn't allowed to.

23 Q In the treatment plant?



- 1 A In the treatment plant.
- 2 Q I take it that instruction not to sample the treatment  
3 plant was not reduced to writing anywhere?
- 4 A No.
- 5 Q No, it was not?
- 6 A No, it was not reduced to writing. It was verbal.
- 7 Q Did the person or persons who told you about this also  
8 tell you why they didn't want it sampled?
- 9 A Yes.
- 10 Q Did they tell you that at the same time they instructed  
11 you not to sample that area?
- 12 A Yes, it was part of the instruction.
- 13 Q Had you verbally requested that you take such a sample?
- 14 A Yes.
- 15 Q What was the reason told to you, not what you surmised  
16 but what you were told, as to why whoever told you not  
17 to take the sample told you not to do it?
- 18 A Because if I went to the sewage treatment plant to take  
19 the sample, I most likely couldn't get the sample  
20 without identifying myself, and the folks at the sewage  
21 treatment plant would want to know why a Westinghouse  
22 employee was sampling the sewage treatment plant. And  
23 at this time, as you can well understand, this project

1 was considered quite high priority top secret within  
2 the company.

3 Q Was it part of the statement that was made to you not  
4 to sample the Winston-Thomas treatment plant that this  
5 project was high priority top secret?

6 A No. Their statement was -- It's not the exact words,  
7 obviously, but they wanted me to take no samples in  
8 such a manner as to draw attention to the sampling  
9 survey.

10 Q And taking samples at the Winston-Thomas plant would  
11 have drawn attention to that survey; is that correct?

12 A Yes. Sure. They didn't object to my sampling the  
13 outfall from the sewage treatment plant. I just  
14 couldn't go into the plant itself and ask to take a  
15 sample of a sludge digester, for instance, or a raw  
16 effluent or something.

17 Q Now we are back to the lunch with Mr. Brittain. What  
18 can you recall about the conversations you had at that  
19 lunch?

20 A Well, basically I told him that my primary concern was  
21 about the movement of PCBs from the plant, Westinghouse  
22 plant, to the sewage treatment plant would most likely  
23 have to have contaminated the sludge as well as the

1 effluent from the plant. I told him that someday all  
2 of this was going to become public because the amount  
3 of PCBs I was finding out there were readily visible to  
4 anyone who chose to sample. I mean it was not that  
5 difficult.

6 Q When you say visible you don't mean you can see them?

7 A No. I mean findable. Anyone who wanted to sample a  
8 fish in the stream would suddenly say wow, where are  
9 all these PCBs coming from. So, I told him that what  
10 they should do is they should put together a stripper  
11 of some sort to take the PCBs out of that effluent  
12 before it went to the sewage treatment plant because if  
13 some years went by before this problem surfaced, the  
14 sewage treatment plant would purge itself. And there  
15 would not be high levels of PCBs in the plant to be  
16 alarmed about or in the effluent downstream from the  
17 plant. Because I felt that would be a fairly easy  
18 thing to do.

19 He said that they had thought about doing that.

20 At the time I didn't realize, no one told me that there  
21 had been a previous study actually of that very thing.  
22 But they had estimated it was going to cost \$10,000 to  
23 do that. And this plant was very marginal in terms of

1 return on investment. They were returning like one or  
2 one and a half cents on the dollar he said. And if  
3 they had to that year shell out a \$10,000 capital  
4 equipment expense like that, it could be enough to  
5 break the back of the plant. He was afraid it would be  
6 closed, and they would all lose their jobs. And so he  
7 said they simply were not going to do that.

8 Q The purpose of the stripper would be to reduce the  
9 quantity of PCBs in the effluents; is that right?

10 A Yes.

11 Q And your recollection of the conversation with Mr.  
12 Brittain was that they did not want to spend \$10,000 to  
13 install some device that would serve that function?

14 A Yes, that's what he told me.

15 Q Do you know if the Bloomington plant ever installed any  
16 devices to reduce the quantity of effluent -- of PCBs  
17 in effluent leaving the plant?

18 A I don't know for sure that they did.

19 Q Prior to the time you left Westinghouse did you ever  
20 inquire of anyone at the Bloomington plant or of anyone  
21 at Westinghouse as to whether such devices had been  
22 installed?

23 A No, I didn't.

1 Q Have you ever heard of something called a manifold  
2 filling system used in the production of capacitors?

3 A I don't remember the term. That sounds like it might  
4 describe the way it was -- If that's the big vacuum  
5 oven where they put them in and evacuate it and flood  
6 it full of PCBs to fill them, I have seen one, but I  
7 don't remember the term manifold filling.

8 Q If I were to tell you that the Bloomington plant  
9 installed a system called a manifold filling, to the  
10 best of my understanding of the term, manifold fill  
11 system, which was designed to reduce the PCBs in the  
12 effluent leaving that plant at an expense in excess of  
13 a hundred thousand dollars, would that be the first  
14 time you had heard that?

15 A I think so.

16 MR. MCCREA: Do you have a year on that?

17 MR. FELDMAN: Not precisely as I sit here.

18 Q If that system were installed sometime shortly after  
19 1971, would it be your understanding that that would be  
20 inconsistent with Mr. Brittain's expressed concerns  
21 about spending \$10,000 for a stripper to install to  
22 reduce the PCBs in the effluent?

23 A Yes. That goes just opposite to what he said they

1 would do.

2 (A recess was taken during which time the  
3 preceding question and answer were read.)

4 Q Looking at the exhibit, the first page of the report of  
5 Exhibit 24 after the cover page you indicate in the  
6 second full paragraph there that one of the goals or  
7 the objectives was to take suitable corrective action.

8 I did not see that in the preliminary report,  
9 Exhibit 23. Who authorized that as an objective of  
10 this project?

11 A I don't know the answer to that. Prior to writing this  
12 report, in fact, prior to beginning the survey, I did  
13 have a meeting along with Dr. Kelly with Dr. Shoupp who  
14 was the vice-president of R and D. And I think the  
15 three of us had a clear understanding of what it was I  
16 was going to do. So, I would say higher management had  
17 in mind that that's what this was going to do. And  
18 that's certainly my understanding of what we were  
19 doing.

20 Q But you can't recall as you sit here today specifically  
21 who it was who authorized that to be a part of this  
22 project?

23 A No, I don't remember.

1 Q You said you brought the report over to the plant  
2 personally; is that right?

3 A Yes.

4 Q And there was a meeting there with Mr. McClain, Mr.  
5 Brittain, Mr. Sawyer and Mr. Sauter; is that correct?

6 A I don't specifically remember the meeting.

7 Q Let me probe that a little bit, if you will, Doctor.

8 When you say you don't remember the meeting do you mean  
9 that you don't remember specifically who was there?

10 A Yes.

11 Q Do you remember anyone who was there?

12 A No. I know that each site I visited -- When I finished  
13 the report I can't remember exactly. I may have mailed  
14 copies of the report ahead of time to this  
15 distribution, but I believe what I did is hand carried  
16 them. But in any event, there was then a meeting so we  
17 could all sit down around the table and discuss what  
18 was in the report.

19 Q But as you sit here today you cannot remember being at  
20 such a meeting?

21 A Who was sitting at the table, no.

22 Q You do remember being at the meeting; you just can't  
23 remember the participants?

1 A I do remember being at such a meeting, but I don't  
2 remember the participants.

3 Q Do you remember how long it lasted?

4 A No, I don't.

5 Q Do you remember whether you began the meeting by giving  
6 an overview of the results of the report?

7 A Basically the only thing I remember about that trip is  
8 my disappointment in talking with Mr. Brittain to find,  
9 at least according to him what he said -- He was the  
10 engineering manager. Maybe someone changed his mind  
11 later on. My understanding when I went home, what I  
12 felt, was the key change was not going to take place.

13 Q Let me make sure I understand you. Other than your  
14 conversation at lunch with Mr. Brittain you can't  
15 remember any specifics about meetings, a meeting or  
16 more than one meeting, which you had with individuals  
17 from the plant to discuss this report?

18 A No, I don't remember meetings.

19 Q Do you remember whether anyone at that meeting or at  
20 any other time told you that you could not disclose the  
21 existence of the report or the results in it?

22 A No. I'm still thinking about the answer to that  
23 question. And the answer to that question is, the



1 words you used I was told, that was my understanding of  
2 the operating procedure about this report and all of  
3 the reports. As to who said those words, whether it  
4 was Kelly, Shoupp or whatever, I don't think it would  
5 have been these people because they were not laying out  
6 the overall ground rules for the survey.

7 If they had had their desire, the survey wouldn't  
8 have happened at all. The survey came from the top  
9 down.

10 Q Did anyone in this group that's on the cover page of  
11 Exhibit 24 tell you that if they had their way the  
12 survey would not have happened at all?

13 A I don't specifically recall those words coming from the  
14 mouth of any of those people. Definitely I was told  
15 that in Sharon, and I know that they shared the feeling  
16 that this was going to do nothing but cause trouble.

17 Q The people at Sharon had that feeling?

18 A Well, the person that I went to at Sharon all but rode  
19 me out of town on a rail the first time I was out  
20 there. These people shared the view that it would be  
21 better off not to do this survey.

22 Q But you don't have a recollection that anyone on this  
23 list of individuals on the cover of Exhibit 24 told you

1       that; is that correct?

2   A    No.   Because the only specific conversation where I  
3       remember the words with anybody at Bloomington is with  
4       John Brittain at lunch.

5   Q    And that's the conversation described earlier  
6       concerning the stripper?

7   A    Yes.

8   Q    Now, are you aware of any efforts undertaken at the  
9       Bloomington plant, personal knowledge that you have of  
10      any efforts undertaken at the Bloomington plant, to  
11      ensure that the existence of Exhibit 24 or the actual  
12      document was never disclosed to the public?

13  A    No, I don't know what they did with the document after  
14      I left.

15                   MR. CARNEY: Off the record.

16                   (A discussion was held off the record.)

17  A    (Continuing) That question you just asked me about  
18      personal knowledge, I do recall that in the exhibits  
19      which we have here that there is a letter where I  
20      believe it was Mr. Westlake who replaced Mr. Sauter or  
21      maybe he's several people down the road did make the  
22      statement that he had no knowledge of any, well, in a  
23      sense he was saying that he had no knowledge of any

1 problems having to do with PCBs in the environment.

2 Now, whether that was he really didn't or the  
3 other people who did didn't tell him or what, but there  
4 was a golden opportunity where it went by where they  
5 didn't mention this report.

6 Q This is a document that you have reviewed in connection  
7 with this case; isn't that correct?

8 A Yes.

9 Q And you hadn't seen that before --

10 A I hadn't seen that before.

11 Q You got to let me finish my questions. You had not  
12 seen that document before you were retained in this  
13 matter; is that correct?

14 A That is correct.

15 Q You have not talked to Mr. Westlake about the content  
16 of that letter?

17 A No, I have not.

18 Q Have you had any conversations with Mr. Westlake?

19 A I have not.

20 Q Are you aware from personal knowledge about any of the  
21 investigation or other context surrounding the creation  
22 of that letter from Mr. Westlake?

23 A No. From personal knowledge, no.

1 Q Have you talked to anyone other than Mr. McCrea  
2 concerning the context and the background of that  
3 letter?

4 A Only talking to Mr. Conard about the letter that caused  
5 the subsequent letter. I believe that was in response  
6 to a letter from Dale Conard. I have talked to Dale  
7 Conard about the letter he wrote.

8 Q Did Mr. Conard indicate to you that he had talked to  
9 Mr. Westlake or anyone else at Westinghouse about  
10 investigations that might have gone into drafting that  
11 letter?

12 A I don't know that he said anything about that.

13 Q And you've never talked to anyone at Westinghouse about  
14 what went into that letter?

15 A No, I have not.

16 Q Do you have any personal knowledge about any efforts  
17 that Westinghouse may have made to keep Exhibit 24 from  
18 reaching any governmental body, state, federal or  
19 whatever?

20 A No. I might refer you to one of the documents I  
21 prepared for Dave and the question about who knew and  
22 why wasn't it made public. And it may have been a  
23 series of coincidences. I don't know.

1 Q You don't know that it wasn't a series of coincidences?

2 A Yes, I don't know that it wasn't a series of  
3 coincidences.

4 Q You don't know whether it was just because people  
5 forgot about it, do you?

6 A Right. I saw in there I saw no evidence of conspiracy  
7 to suppress or anything.

8 Q No trick or artifice to attempt to keep Exhibit No. 24  
9 confidential; is that correct?

10 A I have no knowledge of what became of Exhibit 24.

11 Q So, the answer to my question is you don't know of any  
12 trick or artifice?

13 A Yes, I do not know of any trick or artifice.

14 Q And in fact, you indicate in one of the documents that  
15 you prepared for Mr. McCrea on August 11, 1988 and I  
16 believe testified to some of this at your last  
17 deposition that you personally referred to the sampling  
18 at Bloomington in testimony that you gave on behalf of  
19 Westinghouse either in 1972 or thereabouts; isn't that  
20 correct?

21 A That's correct.

22 Q And you also indicated that as to the sampling that you  
23 did at South Boston -- You have VA, but I assume you

1 mean PA, South Boston?

2 A It's Virginia.

3 Q You indicated in a document you drafted on August 11,  
4 1988 that was included in Exhibit 9 that individuals  
5 from that plant showed officials from the state of  
6 Virginia a copy of the report that you did relating to  
7 that plant; is that correct?

8 A I was told that they did by someone at the plant.

9 Q Who told you that?

10 A I don't remember.

11 Q And that was sometime in 1973, to the best of your  
12 knowledge?

13 A I believe it was about a year or so after I gave them  
14 the report. And I don't really remember when that was.

15 Q And I believe you also indicated that Mr. Ridgway Hall  
16 in connection with your affidavit in 1976 was aware  
17 because you informed him of it that you had done the  
18 sampling in Bloomington in '71, and he didn't object to  
19 your not disclosing the substance of that sampling; is  
20 that right?

21 A I don't remember if I specifically called out sites.  
22 But I told him I had done sampling around Westinghouse  
23 plants. And he agreed we would not delve into that

1 material.

2 Q You were provided with a copy of some testimony that  
3 Mr. Don Sauter gave at the Environmental Management  
4 Board hearings in 1976; is that right?

5 A Yes.

6 Q I'm referring to your Exhibit 10, a letter you sent to  
7 Mr. McCrea on November 6th, 1988. And from your own  
8 knowledge or from things you had heard your review of  
9 that testimony indicated that Mr. Sauter had been  
10 truthful in his responses in that testimony; is that  
11 right?

12 A I believe so, yes.

13 MR. MCCREA: I'd like the record to show  
14 that we have four or five pages of his testimony and  
15 that's all. The balance of his testimony was not  
16 provided.

17 Q Did you ever ask for the remainder of Mr. Sauter's  
18 testimony?

19 A I did not, no.

20 Q Did Mr. McCrea indicate that he would provide that to  
21 you?

22 MR. MCCREA: I think I asked you, Jan.

23 MR. FELDMAN: I don't think you did.

1 A Basically I had the pages that Mr. McCrea supplied to  
2 me. And I responded as I responded based on those  
3 pages.

4 MR. MCCREA: For the record, we do not  
5 have any of the other pages of his testimony.

6 Q In the same document that you sent to Mr. McCrea or  
7 that you drafted on August 11 of this year you make  
8 some mention of something called the Industrial Secrets  
9 Act. What's the Industrial Secrets Act?

10 A I haven't a clue. I thought there was one.

11 Q Why did you think there was such a thing?

12 A I don't know. I was young and naive, I guess. You're  
13 going to ask me who told me that. I haven't a clue.  
14 Somehow I had a feeling that information that was  
15 stamped company proprietary class 1 that if an employee  
16 willingly revealed that to outside company sources that  
17 there would be some sort of legal sanctions.

18 Q Dr. Munson, did you ever ask anybody, any attorneys or  
19 anyone else, as to whether there were such a thing as  
20 the Industrial Secrets Act?

21 A No, I didn't.

22 Q Did you ever go to the library to look it up and see if  
23 you could find a reference to it somewhere?



1 A No.

2 Q Is it fair to say that your belief that there was an  
3 Industrial Secrets Act which might result in some kind  
4 of penalties if you disclosed the Bloomington report is  
5 it fair to say that thought prevented you from  
6 disclosing it before all these years?

7 A Up until the time I left Westinghouse my clear  
8 understanding was that I would lose my job if I  
9 disclosed the information. After that it was my  
10 understanding that I was still prevented by law from  
11 disclosing it. That's why I was not allowed to take  
12 any proprietary material. That was my understanding  
13 that was why I was told why I could not take any of my  
14 notebooks, any of those reports with me when I left.

15 Q Did you ever attempt to verify that even after you left  
16 Westinghouse that you were not permitted either by  
17 company policy or by some law from disclosing any of  
18 the sampling that you did?

19 A No, I didn't.

20 Q Do you remember who told you that you would lose your  
21 job if you disclosed any of this information?

22 A No.

23 Q Do you have any written policies to that effect from

1 Westinghouse?

2 A No.

3 MR. FELDMAN: Let's take a real short  
4 break.

5 (A recess was taken.)

6 Q Dr. Munson, you said you thought you would lose your  
7 job if you disclosed the existence of the report or the  
8 subject matter of the report. What is your basis for  
9 or what was your basis for believing that to be true?

10 A I don't know. I mean I was told that when a document  
11 was stamped company proprietary class 1 that if you  
12 took that document off and handed it to a reporter or  
13 something, No. 1, you'd lose your job, No. 2, you'd be  
14 sued for damages by the company. Now, maybe I was  
15 naive.

16 Q Wasn't it your understanding that the proprietary stamp  
17 was on there to ensure that at least the document  
18 wouldn't be disclosed until the company had a chance to  
19 review it and decide how, if at all, to disclose it?

20 A That wasn't my understanding with the proprietary  
21 stamp. My understanding with the whole program was  
22 that when we use the word scoped out the nature of the  
23 problems, if any, that Westinghouse Electric was having

1 relative to PCBs the necessary remedial steps would be  
2 taken and at some appropriate point the information  
3 would become public. I believed that was going to be  
4 the case.

5 MR. FELDMAN: Can I have his answer back.

6 (The Reporter complied with Counsel's request and  
7 read as directed.)

8 Q I take it from what you said that you didn't think that  
9 the proprietary stamp was intended to be used to  
10 maintain the confidentiality of a document in  
11 perpetuity but only as a temporary matter; is that  
12 right?

13 A My understanding of the proprietary stamp is the same  
14 as my understanding of a classified document that's  
15 stamped top secret, that at some later point someone in  
16 high enough authority can make the decision to  
17 declassify the information. But clearly that wasn't my  
18 authority.

19 Q Prior to your contact with Mr. Ordway were you aware  
20 that there was a Super Fund Cleanup in Bloomington that  
21 was being conducted?

22 A No.

23 Q Prior to your contact with Mr. Ordway did you have any

1 awareness that the PCB situation relating to  
2 Westinghouse had become a matter of public concern in  
3 Bloomington?

4 A Yes, I knew that. I had read some small announcement  
5 in Chemical and Engineering News I think that the  
6 problems around the plant or something relating with  
7 the plant had become public, yes.

8 Q Is it fair to say that apart from that small item in  
9 Chemical and Engineering News that you were unaware of  
10 any of the other details of the Bloomington situation  
11 until Mr. Ordway contacted you?

12 A That's true.

13 Q Doctor, referring to Exhibit 24 on page 1, you list  
14 five possible routes for I guess discharges of PCBs  
15 into the environment; is that right?

16 A Yes.

17 Q And one of those routes is sealed units enroute to the  
18 customer which you refer to as item 1; is that right?

19 A Yes.

20 Q And sealed units means capacitors?

21 A Yes, that's what I was referring to.

22 Q Were you ever made aware of the possibility of  
23 discharges of PCBs into the environment from defective

1 capacitors sold to customers of Westinghouse?

2 A I don't specifically remember a discussion on that  
3 topic.

4 Q You don't recall any discussion while you were at  
5 Westinghouse of the possibility that more PCBs might be  
6 getting into the environment if capacitors manufactured  
7 at the Bloomington plant had a higher defective rate?

8 A I don't remember such a discussion.

9 Q And that's not something you investigated, is it?

10 A No. We were going to go to repair sites which is  
11 presumably where those would come, but we never did  
12 that.

13 Q To your knowledge, had there been any previous  
14 investigations before yours of the third item on page  
15 1, namely transporting of impregnated solid waste to  
16 the sanitary landfill as a means that PCBs might be  
17 getting into the environment?

18 A I believe that at the time I went there they talked to  
19 me about concerns about Neal's Landfill because of the  
20 burning and that sort of thing. And that was why they  
21 stopped using it. I'm not sure -- I don't know if that  
22 answers your question as a study. At that time I was  
23 not aware that anybody like myself had come in and done

1 a study.

2 Q Either at Bloomington or any other landfill; is that  
3 correct?

4 A I don't remember having in my possession somebody  
5 else's study of a PCBs landfill somewhere. I don't  
6 remember having that.

7 Q And you just indicated that when you arrived or shortly  
8 after you arrived in Bloomington someone informed you  
9 that Westinghouse had used Neal's Landfill for a period  
10 of time; is that correct?

11 A Yes.

12 Q And then subsequently directed Neal to stop taking  
13 capacitors to that site; is that right?

14 A I'm not sure who was given the direction, but my  
15 understanding was they stopped using that landfill site  
16 because of problems and they cited burning and some  
17 other things that I don't remember. And they had then  
18 chosen a new landfill site.

19 Q Do you recall who that conversation was with?

20 A Probably Lew Shoaff, but I couldn't swear to that.

21 Q Do you recall someone telling you at that time that the  
22 new landfill site that was to substitute for Neal's  
23 Landfill was chosen in conjunction with the State of

1 Indiana or Monroe County or the City of Bloomington?

2 A I don't remember them saying how it was chosen.

3 Q Other than the burning, can you recall any other  
4 problems that were mentioned as having led to the  
5 switch from Neal's Landfill to another site?

6 A One of them -- I'm not sure who it was. Might have  
7 been McClain. I don't know why McClain's name jumps in  
8 in association with this. But one of them told me  
9 about the farmer adjacent to the landfill. It wasn't  
10 the Conards. It was the other farmer, the farm along  
11 the road there. Might be shown on figure 2. They said  
12 this farmer had had problems of poor reproductive  
13 success, stillbirths, deformities, that sort of thing  
14 with his livestock who drank I think some water that  
15 came across there, water out of the landfill.

16 And that's what specifically caused me to take  
17 those samples right along in there.

18 Q Are you referring to the paragraph at the bottom of  
19 page 6?

20 A Yes.

21 Q Is it your clear recollection today that someone from  
22 Westinghouse told you that there had been a farmer who  
23 had claimed that materials leaching from the landfill

1 were interfering with the reproduction of his cattle?

2 A Yes.

3 Q Can you tell me anything more about the circumstances  
4 surrounding that conversation?

5 A No. Basically I wouldn't have had any way to know  
6 about that because I wasn't allowed to go talk to city  
7 officials, state officials, that sort of thing in the  
8 community because the people at Bloomington, the plant  
9 at the Westinghouse plant, didn't want me to become  
10 visible as a sampling operation.

11 Q Did you review any legal papers in connection with the  
12 lawsuit that you describe at the bottom of page 6?

13 A No.

14 Q Is it fair to say that all of the information that you  
15 have in the bottom of page 6 and top of page 8  
16 concerning the farmer's livestock was taken from  
17 individuals at the plant who allegedly knew about it?

18 A Yes.

19 Q And you never confirmed one way or the other whether  
20 that statement was true?

21 A The answer is no. There was no way I could have  
22 without alerting somebody outside of Westinghouse that  
23 I was concerned about PCBs leaking from the landfill.



1 Q You never talked to any of the farmers in that area; is  
2 that correct?

3 A Absolutely not. I never talked to anybody. I sneaked  
4 over fences and took samples.

5 Q Was the reason that the story about the farmer was told  
6 to you that given that situation Westinghouse wanted to  
7 know what levels of PCBs were in that area?

8 A That's my recollection.

9 Q And that was expressly stated to you?

10 A Yes.

11 Q Did you have information as to specifically where that  
12 livestock was?

13 A Someone showed me on the map where that farm was.

14 Q Is that on figure 2 of Exhibit 24, the area marked  
15 farm?

16 A Yes.

17 Q Have you since come to know who owned that farm at that  
18 time?

19 A No.

20 Q Have you ever done any additional investigation beyond  
21 what you did for this report, Exhibit 24, of possible  
22 contamination that might have led to reproductive  
23 problems in farm animals from that farm?

1 A No.

2 Q And the sample that resulted from your investigation of  
3 that farm is marked BL25 at 2 parts per million on  
4 figure 2?

5 A The sample that came from the farm is that one, yes.

6 Q Were there other samples that you took around that  
7 farm?

8 A Well, the downstream sample, the one BL2, was a fish --

9 Q Excuse me, Doctor. I think you meant BL --

10 A Oh, BL27. Yes. That was part of investigating that  
11 route as well.

12 Q I take it all of the samples that you took in  
13 connection with this report were either sediment or  
14 some other solid; is that right?

15 A I think we took some fish.

16 Q That's what I meant by other solid. You took no water  
17 samples; is that correct?

18 A To the best of my recollection, that's correct.

19 Q Are all of the samples that you took leading up to this  
20 report reflected in the report itself?

21 A I don't know the answer to that. I couldn't answer  
22 that without the record books showing. There may have  
23 been -- Maybe I can answer this way: To the best of my

1 knowledge, every sample that I analyzed that was  
2 collected the data are present in this report. In  
3 other words, up to this point.

4 There may have been one or two samples we took  
5 that I made a judgment call later back in the lab and  
6 did not analyze that particular sample. It may have  
7 seemed redundant or something with another one. There  
8 were some later samples not in this report that I think  
9 some were sent to me by Mr. Shoaff.

10 Q I see references to a BL2. Is there a BL1 somewhere?

11 A Yes, figure 1. There is a BL1.

12 Q What about numbers between 2 or 3 and 27 and 24 and so  
13 on? I don't see numbers in the teens.

14 A Well, without the reports -- Wait a minute. I see some  
15 in the teens here.

16 Q On page 11?

17 A Yes. Okay. Here we go. Figure 5 around the plant  
18 there's 13, 16, 12. There's 14. And then on the next  
19 page figure 6 movement to Stout Creek. That one shows  
20 10, 14, 16, 18, 19.

21 Q Is it your understanding that if there is a BL54, there  
22 ought to be numbers from 1 to 53 in this report?

23 A Yes. Samples that were collected were numbered

1 sequentially.

2 Q Well, look at figure 7. That's a sample BL54 from  
3 Beanblossom Creek that shows .02 parts per million?

4 A Yes.

5 Q Where are 1 to 53?

6 We have found some of them, but we haven't found  
7 them all, have we?

8 A I don't know the answer to that question.

9 Q Do you agree that there are not samples 1 to 53  
10 accounted for in this report?

11 A It looks as though not every single sample that was  
12 collected is represented in this report.

13 Q As you sit here today can you explain that?

14 A What I can tell you for sure is that if the numbers go  
15 from BL1 to BL54, there was a sample taken  
16 corresponding to each number.

17 Q When you began the sampling in Bloomington did you work  
18 continuously exclusively on Bloomington until this  
19 report was issued?

20 A No.

21 Q Is it possible that some of the samples before 54 were  
22 samples of areas other than Bloomington?

23 A No. That's what the BL stands for, Bloomington.

1 Sharon was SR or SH, et cetera.

2 Q I also don't see any samples in this report that were  
3 nondetectable. Do you agree with that that there are  
4 none?

5 A That's probably likely.

6 Q Do you recall taking any samples that were analyzed as  
7 nondetectable for PCBs around Bloomington?

8 A No.

9 Q Everywhere you took a sample you found PCBs?

10 A Yes.

11 Q As you sit here today does that lead you to question  
12 the accuracy of some of the results in your report?

13 A Not at all. If you crawl down in a crevasse in the  
14 Antarctic and take an ice sample, you find PCBs. The  
15 globe is contaminated with PCBs everywhere.

16 Q Did you do any investigations as to what the background  
17 levels for the Bloomington area were for PCBs in soil  
18 or fish or any other of the media that you sampled?

19 A Only to the extent that I tried to position some of the  
20 samples at some remote locations. But I wasn't aware  
21 there was any PCB data in existence at the time.

22 Q Did you attempt to find any by analyzing soil from the  
23 town square or some other area far away from any source

1 of PCB?

2 A Well, some of these samples are kind of far away. And  
3 that's why the detection limit is down, say, at 10  
4 parts per billion.

5 Q 10 parts per billion?

6 A I think so. For some of the sediment samples. Sure.  
7 Didn't I say .010 parts per million. That's 10 parts  
8 per billion. And you sample any field in Indiana  
9 you'll probably get a number like that.

10 Q Is that above the method detection limit for the method  
11 that you were using in analyzing these samples at that  
12 time?

13 A Sure.

14 Q So, as you sit here today you are confident that the  
15 .010 reflects the level of PCBs in that sample as it  
16 existed before you took it out of the soil?

17 A Yes.

18 Q And you didn't find a single sample that was below the  
19 detection limit of your method; is that correct?

20 A Yes. If I had analyzed it and it was nondetectable, it  
21 would appear on the chart and it would say  
22 nondetectable.

23 Q I don't see any like that, do you?

1 A No.

2 Q Can you answer my question?

3 A I thought I had. The answer to your question is as I  
4 sit here today, I believe that every sample I analyzed  
5 for PCBs in the Bloomington survey came out positive.

6 Q Above the detection limit?

7 A Above the detection limit, yes.

8 Q Have you looked at any other data on soil samples  
9 around Neal's Landfill or Neal's Dump?

10 A No, I don't think so. Well, I saw some water samples,  
11 I think.

12 Q If I were to tell you that the EPA in the early '80s  
13 took some samples around Neal's Dump and came up with  
14 several locations where their analysis found no  
15 detectable level of PCBs in soil, would that lead you  
16 to doubt the accuracy of your samples which  
17 consistently came up with something above the detection  
18 limit?

19 A Not at all.

20 Q You just think it is coincidence that they found  
21 nondetectable and you didn't?

22 A No, I don't say it is coincidence. Their detection  
23 limit quite possibly wasn't as low as mine. Perhaps if

1       they remember, I managed an EPA laboratory for a while,  
2       the organic analysis section where we routinely did PCB  
3       analysis.

4   Q   You weren't managing an EPA laboratory, though, when  
5       you did this study in 1970 and '71, were you?

6   A   No. But what I'm going to tell you is frequently one  
7       makes a management decision that this laboratory is not  
8       concerned in any values lower than a certain value, and  
9       you report those values as nondetectable. It's a  
10      little harder to detect the low value. You only work  
11      as hard as you have to. So, if it is well below some  
12      enforceable limit, you may well not bother to analyze  
13      below that level.

14   Q   Do you recall as you sit here today that the detection  
15      limit, the method detection limit, for your laboratory  
16      analysis in '71 was .01 PPM?

17   A   It depends on what sample you're talking about.

18   Q   The soil samples.

19   A   I don't specifically remember what my detection limit  
20      was at that time. I don't remember that I put it in  
21      this report.

22   Q   I'm sorry. I thought you referred to it as .010?

23   A   No. I said there was a reported .010.



1 Q And from that you figured your detection limit had to  
2 be that or better?

3 A Sure.

4 Q But you don't know how low it went?

5 A I don't recall how low it went. It depends on what  
6 size sample we were using and a whole bunch of factors  
7 in the analysis. We did have samples that we analyzed  
8 at the same time that we analyzed these that came out  
9 as zero. Those were our control samples. We had some  
10 very clean sand. Every set of samples that we analyzed  
11 from Bloomington or anywhere else in each sample set  
12 there was a control sample of clean sand. If that did  
13 not come out to be zero, then we would suspect the  
14 results. That's part of quality control in a  
15 laboratory.

16 For the tissue samples we had a sample of beef  
17 liver that came out zero for PCBs.

18 Q How did you determine what the detection limit was for  
19 any particular sample that you took in 1971?

20 A It's a calculation one makes based upon -- There is no  
21 short answer to this question.

22 Q Well, I don't want you to tell me how generally one  
23 makes it. I want you to take a sample that you took at

1 a level like .1 parts per million in soil from  
2 Bloomington and tell me how you determine what the  
3 detection limit was for that, if you remember.

4 A Well, I remember how it's done. Basically --

5 Q Excuse me. I just want to be sure you understand my  
6 question. Do you remember how it was done by you in  
7 1971?

8 A Yes.

9 Q Go ahead.

10 A The way the analysis works, you inject the sample in a  
11 gas chromatograph. Out of the gas chromatograph you  
12 get a series of peaks. They look like a bunch of  
13 wiggles on the chart. You've probably seen them on the  
14 bits of evidence we have here. Basically you can turn  
15 up the magnification on those wiggles and make those  
16 peaks taller. There is some limit as you increase this  
17 sensitivity where the noise if the instrument gets so  
18 big that you can't see the little peaks anymore.

19 Okay. Now, typically one chooses a signal to  
20 noise ratio of 5 to 1 or something like that. But you  
21 look at the chart. If you can see the little peaks  
22 that correspond to all the peaks in PCB, that's your  
23 detection limit. Now, as to what it calculates out in

1 a given sample, you have to go from there how many  
2 nanograms that represents in the instrument and back  
3 calculate on how much solution did you have and how  
4 much of it did you take to inject in the instrument,  
5 how much sample did you start with to make that extract  
6 that was that solution, and all of those numbers are  
7 involved. The number is different from soil than it is  
8 for fish than it is for water.

9 Q To determine whether your instrument was accurately  
10 detecting or recovering, if you will, levels at the .01  
11 parts per million level of PCBs at that level did you  
12 inject a known quantity at that level into a blank  
13 sample and determine whether it would bring that back?

14 A I don't remember if we did any recovery studies at that  
15 level.

16 Q What's that called, that kind of confirmation that I  
17 just described?

18 A I think you would call that running a spiked sample.  
19 If we were losing any, the effect would mean that the  
20 value we reported for the sample was actually lower  
21 than it really was in the sample. The control sample  
22 guards us against having a sample come up positive when  
23 it really ought to be negative because we've

1 accidentally got contamination in the lab or something.

2 Q That wouldn't be the case, though, if there is noise  
3 from other substances that's being disclosed in your  
4 gas chromatograph such as pesticides; isn't that  
5 correct?

6 A That could be mistaken for PCBs, you mean?

7 Q Yes.

8 A Yes, that kind of noise would give you a higher result  
9 unless you corrected for it.

10 Q Can you define what's meant by the term field blanks?

11 A Usually a field blank is a sample, a clean sample, you  
12 start with in the laboratory that you carry out to the  
13 site and then bring back with you with the samples that  
14 you have collected, and you analyze that along with the  
15 samples.

16 Q Isn't it correct that you take the blank from the  
17 laboratory and you insert that into the container that  
18 you are using in the field and then bring that back and  
19 test it to see if there is any contamination from the  
20 container?

21 A You can't have your field blank and a sample in the  
22 same container. What you do is you put it in one of  
23 the containers. All it does is test that one

1 container. The real purpose of the field blank is  
2 you're concerned about when you collect the samples out  
3 in the field maybe you put them in the back of a truck  
4 that somebody spilled PCBs in or something and they  
5 could migrate in. Well, they would also contaminate  
6 your field blank at the same time.

7 Q And what's the nature of the substance you take from  
8 the laboratory to use as a field blank out in the  
9 field?

10 A It can be any material. Usually if you are going to  
11 sample a biological specimen, you take some biological  
12 material. If you sample soil, you take a soil or sand  
13 or something that will go through the same analytical  
14 procedure.

15 Q Did you have field blanks in any of the samples you  
16 took in Bloomington?

17 A No, we were not using field blanks at that time.

18 Q Where did you get the equipment that you used to take  
19 the soil samples around Neal's Landfill?

20 A We brought that equipment with us from the ocean  
21 research lab.

22 Q Describe the equipment for me.

23 A Dry soil in the field I think we simply used a trowel

1 or a small shovel. The stream sediment samples we used  
2 a -- I can't remember the name of it, but it's a device  
3 that you drop into the water with it loaded open and  
4 then send a little messenger down and it trips it  
5 and --

6 Q Is that a grab sample?

7 A It's a grab sample, but there is a specific name for  
8 it.

9 Q And it goes below the surface of the water; is that  
10 right?

11 A Yes. It's designed to take sediment samples from the  
12 bottom of the stream.

13 Q Did you just have one trowel for all the soil samples  
14 you took?

15 A I don't remember. We rinsed them between samples.  
16 That's a routine process. Rinsed them with solvents.

17 Q What did you carry the solvents in?

18 A Probably gallon bottles that they come in from the  
19 manufacturer.

20 Q How did you rinse them? What was the process?

21 A We poured the solvent over the implement.

22 Q Poured it over this implement into the ground?

23 A Yes.

1 Q Did you ever collect any of the solvent that you used  
2 to wash the trowel?

3 A No.

4 Q Never tested any of that to see if there was anything  
5 on it; is that right?

6 A Oh, the solvent itself before I rinsed with it?

7 Q Start with that, yes.

8 A Yes. The solvents were purchased. They're special  
9 glass distilled solvents designed for pesticide  
10 analysis. Each bottle is quality controlled by the  
11 manufacturer to have a minimum level of electron  
12 capture peaks.

13 Q And that was being used in 1971; is that correct?

14 A Yes.

15 Q But you don't remember how many trowels you had?

16 A No.

17 Q Do you remember the size?

18 A I don't.

19 Q Can you give us an estimate or you have no recollection  
20 of it?

21 A Well, I was gathering enough samples to fill a pint  
22 jar. So, something on the order of a garden trowel.  
23 Possibly I think we had a small like folding Army

1 shovel.

2 Q Did you wear any special kind of clothing?

3 A No.

4 Q What kind of jars did you use to collect the samples,  
5 soil samples?

6 A Glass jars with lids lined with aluminum foil prerinsed  
7 with solvent.

8 Q Prerinsed at the lab?

9 A Yes.

10 Q Where was your lab?

11 A Annapolis, Maryland.

12 Q Is it the case that all the samples were analyzed at  
13 Annapolis?

14 A Yes.

15 Q Did you mail them out there? UPS them out there?

16 A Except for the samples that were sent to me by Lew  
17 Shoaff, they were carried by the people who did the  
18 sampling in the back of a pickup truck.

19 Q You drove from Bloomington to Annapolis with the  
20 samples?

21 A Yes.

22 Q And all the samples were transported in that manner?

23 A Except the samples mailed by Lew Shoaff, yes.



1 Q What kind of jars were they?

2 Was it a Ball jar or something of that nature?

3 A No. These were specimen jars bought from a laboratory  
4 supply house.

5 Q Had they been used before?

6 A No.

7 Q How do you know that?

8 A I bought them new.

9 Q Were they used again after this?

10 A Possibly.

11 Q But this was the first time these jars had been used  
12 for samples?

13 A Yes.

14 Q Were any of them reused in the course of the sampling  
15 in Bloomington?

16 A I really don't know.

17 Q So, some of them might have been reused?

18 A Possibly.

19 Q If they were reused, where would they have been  
20 cleaned?

21 A In Annapolis.

22 Q Under your supervision?

23 A Yes.

1 Q By you?

2 A Probably not.

3 Q When you say under your supervision, what do you mean  
4 by that?

5 A Following the protocol that I prescribed done by a  
6 technician that I had trained.

7 Q Would you expect that in samples taken from a rural  
8 farm area that there would be greater levels of  
9 pesticide in the soil than in other areas?

10 A You mean as detectable by the methodology which I was  
11 using?

12 Q I guess I meant just generally would there be more  
13 pesticide in the ground in soil taken from a rural area  
14 farmland?

15 A It depends upon what they're using. Some pesticides  
16 break down to nondetectable sorts of residues. If they  
17 had used chlordane and DDT, things of that nature, I  
18 would expect to find residues of those. But not  
19 everybody uses those.

20 Q What did you do to strip out the pesticides from your  
21 samples?

22 A Basically the only -- We didn't strip them out. If  
23 they occurred in the chromatogram, we corrected for

1       them.

2   Q   Mathematically?

3   A   Yes.

4   Q   What is a Florisil, F-l-o-r-i-s-i-l, Florisil column?

5   A   It's a column of an adsorbent called Florisil usually  
6       an inch or so in diameter. Typically they're used for,  
7       well, one of the procedures is a general cleanup  
8       procedure, I believe, just to get rid of materials in  
9       general. If my memory is serving me rightly, there was  
10      a procedure that someone published for separating  
11      pesticides from PCBs using such a Florisil column.

12             The person who wrote the procedure touted it  
13      highly. A lot of others, including myself, found it  
14      didn't work very well in our hands and don't use it.

15   Q   Isn't it the case the use of the Florisil column is  
16      part of the approved EPA method for stripping samples  
17      of pesticides?

18   A   I think it is in their steps, yes.

19   Q   You didn't use that or any other method for eliminating  
20      pesticides from your PCB samples; is that right?

21   A   I wouldn't say that, no. We used a method of digesting  
22      the extract from fuming sulfuric acid which destroys  
23      all but the most resistant of the pesticides.

1 Q Why did you need to do that if you could get rid of the  
2 pesticide noise through calculations in the lab?

3 A We would remove -- Well, two reasons. When you say  
4 pesticides we're talking a broad range of chemicals.  
5 That's the manner in which I answered that last  
6 question. We used the fuming sulfuric acid to remove  
7 the unwanted organic materials including all those  
8 pesticides that could be degraded by fuming sulfuric  
9 acid.

10 Q Which is not all of the pesticides; isn't that true?

11 A That's correct.

12 Q What did you do to remove those remaining pesticides?

13 A We didn't remove them. We corrected for them  
14 mathematically.

15 Q Isn't it the case that having those remaining  
16 pesticides in the sample makes it impossible to  
17 accurately measure PCBs at levels in the tenths and the  
18 hundredths part per million in the soil?

19 A That's not the case. That depends upon the given  
20 sample how much PCB is there, how much pesticide is  
21 there. If you have very high quantities of pesticide  
22 compared to the PCB. Accurately, yes, it's difficult.  
23 Once again, you have to talk about what do you mean by

1 accurately. If you mean plus or minus 1 percent  
2 accuracy, you have a problem.

3 Q Can you tell me what the accuracy level was for your  
4 sample that showed up .01 parts per million?

5 A Not really.

6 Q Why is that?

7 A Well, in order to determine that you have to go through  
8 a considerable exercise which if I ever went through  
9 it, I don't remember it with a sample. We were looking  
10 for movement of PCBs from the plant, from the landfill.  
11 We weren't terribly concerned with 10 parts per million  
12 or .01 PPM. And we weren't terribly concerned with  
13 plus or minus 1 percent or even a tenth of a percent  
14 accuracy.

15 Q You say you weren't concerned with .01 parts per  
16 million. Is that because that level is so low that it  
17 is not a matter of concern?

18 A No. In a soil sample out in the middle of a farmer's  
19 field that may be of concern if a farmer is growing  
20 fodder for his animals. But the thrust of this survey  
21 was to look for large scale problems. It looked as  
22 though the .01 PPM level was the background. I assumed  
23 it was from aerial fallout.

1 Q What made you assume that was a background level?

2 A Because I found it in all of the samples.

3 Q You found that or greater in all the samples; is that  
4 what you're saying?

5 A In the samples I analyzed, yes, I think so.

6 Q So, when you say on page 6 at the top that the .14  
7 parts per million found in B26 is about 10 times the  
8 background from environmental fallout, what you meant  
9 was it's about 10 times the lowest level that you found  
10 in the samples you took; is that right?

11 A Yes. That's correct.

12 Q You said that you didn't know what the accuracy level  
13 was for a sample in the .01 part per million range. Do  
14 you know what the accuracy is of any sample in this  
15 report?

16 A I don't remember. We did a few samples in duplicate.  
17 And that gives a person a clue as to what the accuracy  
18 is. If you don't want to go to more rigorous methods,  
19 do a sample twice and see how close the numbers  
20 compare.

21 Q What else would one do to compare what the range of  
22 error is in the sampling other than doing two samples,  
23 running two analyses of the same sample?

1 A Well, if you really want to beat on it hard, you have  
2 to do things like run a hundred samples of what's a  
3 homogeneous sample. Various people try various things.  
4 You can try spiking a sample with a known quantity and  
5 seeing what you recover. But the problem there is what  
6 if some of it is reversibly absorbed into the sample.  
7 What does that do to your accuracy. Accuracy is a  
8 measure of how close a value is to the true value.

9 Actually to be precise -- Pardon me -- reproducing  
10 the same sample many times really is just a measure of  
11 your precision. In other words, how close a repetitive  
12 measurement is the same measurement. You can still be  
13 at some distance from a true value.

14 Q What else does one do other than spike samples and  
15 trying to reproduce the same sample?

16 What else does one do to try to determine what the  
17 range of error is in a method?

18 A Well, that's really the most common way. EPA now is  
19 very big on using labeled standard materials, rated  
20 compounds that are essentially the same compound with  
21 an internal chemical label in it that you spike into  
22 your sample and then along with your sample value  
23 report the recovery of that particular spiked material.

1 Q You didn't do that either?

2 A Oh, that procedure came many years after the time I did  
3 this study.

4 Q What does the term round robin refer to?

5 A A round robin basically is where you construct  
6 homogeneous samples and then split them into sets and  
7 send the sets off to various laboratories to do the  
8 analysis.

9 Q You didn't do that either, did you?

10 A No, I didn't, not with this study. How could I. This  
11 study was secret. I did do some sample splits with the  
12 Maryland Department of Natural Resources laboratory and  
13 occasionally with the EPA laboratory.

14 Q Not in connection with this sampling program, though?

15 A No, but with similar samples from other programs.

16 Q You didn't do that with any of the samples that you got  
17 from the project involving the various Westinghouse  
18 plants, though, did you?

19 A No.

20 Q Did you use any carbonless copy paper, carbonless paper  
21 forms, around the time that you were doing the samples?

22 A No. We were aware that they contained PCBs and are a  
23 source of internal contamination. At this time the gas



1 chromatograph we had drew the line with an inked pen on  
2 the paper.

3 (A recess was taken.)

4 Q You raised that, Doctor, because I assume you suspect  
5 now or may have suspected then that there might have  
6 been some contribution of PCBs from that ink; is that  
7 correct?

8 A No. No. A later instrument we bought from Hullett  
9 Packard had an -- it's not a carbonless reproducing  
10 paper but essentially the line appeared by a heating  
11 process. We did analyze the paper and found no PCBs,  
12 but we were concerned because it was an ink-impregnated  
13 paper.

14 Q Did you ever analyze the ink that was used to draw the  
15 profile in the samples that you took in Bloomington?

16 A No.

17 Q Is it possible that could have contributed PCBs to the  
18 samples?

19 A I really doubt it.

20 Q But it is possible?

21 A I don't think so.

22 Q Why not?

23 A Well, basically if you have a source of contamination

1 in the laboratory, if it's a source in the room like a  
2 ballast from a light, for instance, that has PCBs in it  
3 or did at that time, then you have to imagine, then,  
4 that every sample has a chance of being contaminated.

5 We ran blank samples that came up zero below our  
6 detection limit. We had quite a number of other  
7 samples we analyzed that were down in the low part per  
8 billion range. If we had such an internal source of  
9 PCBs, I think it would have been obvious.

10 Q What other PCB samples were run in that laboratory in  
11 Annapolis around the time that you were running the  
12 Bloomington samples?

13 A I don't remember exactly the chronology. But we did  
14 have samples out of the Chesapeake Bay sediments. None  
15 of them were -- Well, few of them were very high. Put  
16 it that way. There may have been an overlap that some  
17 of the samples from South Boston, the Westinghouse  
18 plant there, and with Sharon, Pennsylvania, the  
19 Westinghouse plant there.

20 Q Did you have any samples of oil?

21 A Of transformer oil? We had several, yes. I think we  
22 had one sample from an oil skimmer at South Boston.  
23 And, of course, we had the PCB standards themselves

1       that were the ones I had were like pint jars of PCBs  
2       from Monsanto.

3   Q   Other than those did you have any other oil samples?

4   A   No, I don't think so.

5   Q   Were you doing any samples at that time for Sharon?

6   A   Didn't I just say that?

7   Q   Is that where the skimmer was?

8   A   No. The skimmer was South Boston. But Sharon and  
9       South Boston, those samples may have been overlapped at  
10      one time with the samples at Bloomington.

11   Q   Were the Sharon samples oil samples?

12   A   I don't think so. They were stream sediments and  
13      biota.

14   Q   Were you capable of analyzing water samples at the time  
15      you did the Bloomington project?

16   A   Yes.

17   Q   Were you doing it at that time?

18   A   I don't think I was doing any water samples at that  
19      time.

20   Q   Do you know what temperatures you ran the gas  
21      chromatograph on the samples in Bloomington?

22   A   I couldn't tell you without looking it up somewhere.

23   Q   Where would you look it up?

1 A I'd have to find a report that describes the  
2 methodology I used.

3 Q Is there such a report somewhere?

4 A I suspect so, yes.

5 Q Where?

6 A Well, we were using a fairly standard methodology. I  
7 think the method, well, No. 1 -- I hate to keep saying  
8 it -- it's in the record books. No. 2, I believe in  
9 the report called the Chester River survey. And quite  
10 likely it's very similar to what we were using in  
11 several of the references in my CV.

12 Q I'm sorry. Is one of those published somewhere or is  
13 it just in the record books?

14 A The Chester River survey was a printed volume. It  
15 wasn't published in the refereed literature.

16 THE WITNESS: Did I send you a copy of  
17 that?

18 I sent you a copy of -- Mr. Ordway, did I send you  
19 any bound volumes?

20 At one point you asked me for everything I had  
21 published on PCBs. I sent you quite a stack. I  
22 thought I had included a copy of the Chester River  
23 study and a three-volume set of the Upper Bay survey

1 report.

2 Q In any case, would one of those documents contain the  
3 methodology that you used on the Bloomington samples?

4 A I think so, yes.

5 Q When you say you think so, do you have some doubt about  
6 this?

7 A Yes.

8 Q Is the doubt as to whether it's the same method or is  
9 the doubt as to whether it was published?

10 A The doubt is it was almost 20 years ago, and I haven't  
11 had my record books in those 20 years. And to best of  
12 my recollection, we used the same protocol for all the  
13 samples during that period. I believe it was an  
14 isothermal gas chromatograph run at a particular  
15 temperature. And I don't remember the temperature.

16 We used several different columns. And there was  
17 a temperature that was optimal for one type of column  
18 and a temperature that was optimal for another type of  
19 column.

20 MR. McCREA: Jan, do you have the  
21 information he sent through Mr. Ordway?

22 If you do, you could hand it to him and save time.

23 MR. FELDMAN: Thank you.

1 MR. McCREA: We've requested it. Check  
2 the mail.

3 Q Did you keep records of what the peak heights and the  
4 sample weights and the calculations you went to to  
5 ultimately produce your parts per million in these  
6 samples?

7 Is that also in your record books?

8 A Absolutely.

9 Q What is the difference between peak height and pattern  
10 recognition method?

11 A I'm not quite sure what you're referring to. The  
12 pattern recognition is how you decide you have PCBs in  
13 the first place. You should have a certain pattern of  
14 peaks with certain relative peak heights among the  
15 peaks. You may be referring to some buzz words in a  
16 terminology, perhaps, that's been generated since I  
17 last did the analysis. You use the peak heights, then,  
18 of either all the peaks or specific peaks to estimate  
19 the quantity.

20 Pattern recognition is used to decide, No. 1, do  
21 you have PCB, and if so, which formulation.

22 Q Going back to Exhibit 24, again, on page 1 you say  
23 until very recently capacitor cans were coated on the

1 outside with Inerteen which was removed by a washing  
2 process.

3 What is the change that was in effect in the six  
4 months before you wrote Exhibit 24, if you can recall?

5 A I don't know. I read that sentence recently and  
6 wondered myself. And that sentence implies they don't  
7 fill the capacitor cans that way anymore or didn't by  
8 the time I wrote this report.

9 Q But you can't recall what the different process was?

10 A I really don't. I really can't.

11 Q Do you now believe that Clear Creek does not empty into  
12 Monroe Reservoir?

13 A I think somebody told me that, but I have not verified  
14 that with maps. I don't know. If it does not, then I  
15 made a mistake at the time.

16 Q Were you ever able to identify any other sources of  
17 PCBs into Clear Creek other than the sanitary sewer  
18 system?

19 A I'm trying to find that map on this report. It's been  
20 a while since I've looked at this report.

21 Q Would it help you to look at a map of the city of  
22 Bloomington?

23 A I thought I had a map in here showing Clear Creek.

1 MR. McCREA: Is this it?

2 THE WITNESS: Yes. Yes. That's it.

3 MR. McCREA: Page 4. The fourth page.

4 A (Continuing) To the best of my recollection, the only  
5 samples I have from Clear Creek are the ones that are  
6 shown here. I don't recall that I was aware of any  
7 additional input -- Well, at the time I don't think I  
8 drew the conclusion there was anything other than the  
9 plant.

10 Q How did you determine that the 64.2 parts per million  
11 in BL2 couldn't have resulted from someone spilling  
12 brake fluid or transmission fluid or some other  
13 accidental single spill into that part of Clear Creek?

14 A I didn't determine that. I took the sample where the  
15 sewage treatment effluent was obviously adding a sludge  
16 type deposit to the creek, and I analyzed the sample.  
17 And I made that leap of logic.

18 Q So, it is possible as you sit here today, isn't it,  
19 that that 64.2 parts per million might have resulted  
20 from something completely independent from the  
21 treatment plant, isn't it?

22 A Anything is possible.

23 Q And it requires a leap of logic to reach the conclusion



1 that you reached on page 2 of Exhibit 24, does it not?

2 A When I knew that they were discharging Inerteen down  
3 the sewer and it went to that plant and I find it out  
4 at the end of the effluent pipe in the sludge it's not  
5 a very big leap. But yes, I made an assumption. I  
6 drew that conclusion.

7 Q How many samples did you take below the sewage  
8 treatment plant from Clear Creek?

9 A I don't recall at the moment. We could thumb through  
10 the report and figure it out, maybe. We obviously took  
11 the one at Ketcham Road. Yes. I really don't  
12 remember.

13 Q Well, do you see any reference to any other samples  
14 from Clear Creek other than the ones reflected on  
15 figure 1?

16 A No, I don't.

17 Q Do you conclude from that that there probably weren't  
18 any if they don't appear in the report?

19 A Well, I would believe that if I had taken others I  
20 probably didn't analyze them because I believe this  
21 report showed all of the ones that we analyzed.

22 Q Do you think that as a researcher in the fate of PCBs  
23 in the environment that taking three samples downstream

1 from the sewage treatment plant gives you sufficient  
2 data base to determine that PCBs were moving out of  
3 that sewage treatment plant?

4 A You're questioning my judgment that the 64 PPM came  
5 from the plant? I don't understand your question.

6 Q All right. Let me rephrase it. As I see it, you have  
7 taken three samples of Clear Creek below the sewage  
8 treatment plant; is that correct?

9 A You're counting the one in Monroe Reservoir?

10 Q I wasn't counting that because it doesn't really go  
11 into Monroe.

12 A Are you counting the 6.98 one? There's the Winslow and  
13 then there is the Rhorer Road. Are you counting BL1, 2  
14 and 3?

15 Q Right.

16 A Okay. I think those are the ones I took adjacent and  
17 downstream from those, yes.

18 Q Now, as someone who has done research into the movement  
19 of PCBs from various sources, do you think taking three  
20 samples in this configuration is an adequate data base  
21 to determine that there is sufficient movement of  
22 Inerteen into Clear creek from the treatment plants?

23 A In this case I think the only way I could have added to

1 the strength of my contention was to have sampled the  
2 sewage treatment plants themselves which I was not  
3 allowed to do. If I had taken a hundred samples within  
4 10 feet of the BL2 sample, it would still be open to  
5 the contention that somebody made an isolated spill.

6 If I were allowed to study movement from the  
7 sewage treatment plant, obviously I first want to  
8 sample the sewage treatment plant, then sample  
9 downstream. The answer to your question is no, this is  
10 not an adequate study. I wasn't allowed to do an  
11 adequate study.

12 Q But even if you weren't allowed to sample the sewage  
13 treatment plant isn't it the case if you did a greater  
14 grid or a longer string of samples downstream from the  
15 sewage treatment plants you could have gotten a clearer  
16 idea as to why PCBs in that creek were emanating from  
17 the sewage treatment plant?

18 A Not at all. Open to the same contention. Somebody  
19 spilled it at BL2. It's now moving downstream. It  
20 doesn't matter if I got a hundred samples. Doesn't  
21 change it. The contention of whether it's coming from  
22 the sewage treatment plant to the stream, sample the  
23 plant, sample the effluent pipe. I wasn't allowed to

1 do any of those things.

2 Q What is between Rhorer Road and Winslow Road in Clear  
3 Creek?

4 A I don't remember.

5 Q Can you explain why there is only 6.9 parts per million  
6 in BL1 and 64.2 at BL2?

7 A No, I can't explain that. I can invent you a scenario  
8 that would cause it to happen that way. But I do not  
9 know the answer to the reason why one is 6.9 and the  
10 other is 64.

11 Q Is it your testimony that unless you were allowed  
12 inside the sewage treatment plant you could not have  
13 provided any more certainty for your conclusion about  
14 movement from the sewage treatment plant by doing other  
15 samplings in Clear Creek?

16 That's a complicated question. Do you want me to  
17 redo it or do you understand it?

18 A No. I think I understand it. If we're trying to make  
19 an assessment of grams, if you want, of PCB moving  
20 downstream from the point of discharge, certainly, a  
21 lot of other samples. Bottom grab samples really are  
22 just an indication that at some point PCBs went by  
23 there. They don't help you too much as far as amount.

1 But the key question is did it come from the  
2 sewage treatment plant. I had knowledge that it was  
3 going to the sewage treatment plant. But one would  
4 like to sample the effluent from the sewage treatment  
5 plant.

6 Q All right. Let me do that again. If you took  
7 additional samples of Clear Creek downstream from the  
8 sewage treatment plant, isn't it true that you would at  
9 least be able to tell whether the samples you got were  
10 isolated or whether they were reflected in a lot of  
11 other samples between the two points BL2 and BL3?

12 A Yes. Yes. Okay. If I understand what you're saying.

13 Q Wouldn't it be the case that if you sampled a number of  
14 different location between BL2 and BL3 and they came up  
15 nondetectable that you would not have concluded that  
16 there was a substantial movement of Inerteen into Clear  
17 Creek from the treatment plant?

18 A If they had come up nondetectable, it would have been  
19 quite unusual. Once again, that doesn't bear on  
20 whether or not the PCB came from the sewage treatment  
21 plant. You remember that the link between the sewage  
22 treatment plant and BL2 isn't affected by whether or  
23 not I took a hundred samples between those two.

1           Now, if I took a hundred samples between those two  
2           and they all came up nondetectable, then something  
3           would be very strange because there was a movement of  
4           water and sediment downstream from BL2 to BL3. And it  
5           would be very unusual if I had 64.2 at BL2,  
6           nondetectable for a hundred samples and 2.81 at BL3.  
7           It doesn't make sense.

8   Q   It doesn't make sense if you assume discharge from the  
9       treatment plant; isn't that right?

10  A   It has nothing to do -- If the sediment from BL2 is  
11       heavily contaminated, the water movement coming by  
12       picks up the contaminated particles, carries them  
13       downstream. The downstream sediment can't be clean.

14  Q   Unless that sediment sample recently was deposited  
15       there?

16  A   You mean like five minutes before I sampled, okay,  
17       maybe so. We can invent scenarios to cover just about  
18       anything.

19  Q   If you were going back to redo that, would you have  
20       taken more samples between BL2 and BL3?

21  A   No, not if I had the same marching orders. Because we  
22       were looking at the overall environment around  
23       Westinghouse. It was a given that PCBs were going to

1 the sewage treatment plant. The question was how bad  
2 is the sediment there in the stream. I sampled it, and  
3 I answered that question. I sampled downstream a ways.  
4 Are they moving downstream. The answer, as far as I'm  
5 concerned, is yes.

6 Q Based on two samples?

7 A Based upon two samples and my knowledge of the movement  
8 of PCBs in the environment.

9 MR. McCREA: Jan, could I ask a question?

10 MR. FELDMAN: Yes.

11 MR. McCREA: Are you disputing this  
12 information?

13 Are you contending this information is not  
14 accurate, that PCBs from the Westinghouse plant  
15 contaminated Clear Creek?

16 If you are, I don't mind the questions. I don't  
17 see how you can seriously doubt. Agreed to clean it up  
18 and it is a PCB. If you can answer that question,  
19 obviously I would object to the line of questioning as  
20 being an utter waste of time.

21 MR. FELDMAN: I don't think it's a waste  
22 of time. He's written a report and come to some  
23 conclusions. And I'm probing the conclusions.

1 MR. McCREA: It seemed to me you would be  
2 willing to stipulate that PCBs from the Bloomington  
3 Westinghouse plant in fact contaminated Clear Creek. I  
4 don't see there is any dispute in that. I don't know  
5 why we're going into all those questions.

6 Q Doctor, on page 4 at the top you've got another  
7 reference to an anticipated background level for a  
8 clean lake. What is the background level that you are  
9 referring to?

10 A The top line is missing from my copy.

11 Q It says -- I can read you my copy. Although the level  
12 of PCBs is about 50 times above the anticipated  
13 background, et cetera, et cetera.

14 A Yes. You're asking what the level for a clean lake  
15 would be?

16 Q Right.

17 A I don't see the value I'm referring to here. But  
18 basically one expects down at the 10 to 20 to 30 part  
19 per billion level in a sediment, .01 to .03 PPM,  
20 something like that, in a sediment in a clean lake or  
21 sediment in the Chesapeake Bay or wherever. Much  
22 higher levels indicate some input of some local source.

23 Q .01 parts per billion; is that what you said?



1 A No. No. .01 parts per million, 10 parts per billion,  
2 dry weight sediment.

3 Q So that the level in a clean lake is the same as the  
4 level in soil?

5 A It's in the same ball park. Depends upon the grain  
6 size of the sediment and quite a few others things.

7 Q Did you derive that from some review of the literature  
8 on background levels in lakes and soil or was it from  
9 the fact that the lowest level you got in sampling was  
10 .01?

11 A I don't remember exactly whether it came from this  
12 data, Chesapeake Bay, review of the literature. Levels  
13 around .01, .03, .04, .05 are typically what people  
14 find everywhere.

15 Q But you don't remember where you got that?

16 A No.

17 Q Moving on to the sanitary landfill, No. 1 on page 4,  
18 under 2.1 it says during the approximate period 1957 to  
19 '67 both solid and liquid Inerteen wastes were removed  
20 from the plant for disposal in the sanitary landfill  
21 adjacent to Highway 48.

22 Who told you that?

23 A Lew Shoaff.

1 Q Do you have any question in your mind that Lew Shoaff  
2 told you that the latest period of disposal of  
3 Westinghouse Inerteen waste to that landfill was 1967?

4 MR. McCREA: I don't want to be picky, but  
5 that's not what the statement says. The statement says  
6 both solid and liquid Inerteen. I don't want to answer  
7 the question for him, but the statement does not say  
8 that they ceased disposing of PCBs at the landfill.  
9 That's not what it says. It says both solid and  
10 liquid.

11 Q Did Mr. Shoaff tell you that any Inerteen wastes from  
12 Westinghouse were taken to that landfill in 1967?

13 A I don't remember. Basically this was background  
14 information which was supplied to me by Lew Shoaff. I  
15 apparently at one point made some notes that during the  
16 period 1957 to 1967 that's where the solid and liquid  
17 wastes from the plant were going, and after '67 I guess  
18 they were going to another landfill.

19 Q That was your understanding at that time?

20 A I believe so.

21 MR. FELDMAN: Does that clear it up for  
22 you, David?

23 MR. McCREA: That certainly clears it up

1 as to what was told him. But I can also understand how  
2 Lew Shoaff would say solid and liquid Inerteen were  
3 disposed to '67 and thereafter only solid. I mean I  
4 could understand how the source of the information  
5 could be saying one thing and Dr. Munson could be  
6 interpreting another.

7 MR. FELDMAN: But there is no question as  
8 to his understanding in your mind?

9 MR. McCREA: That's true. I don't dispute  
10 what Dr. Munson has written down. I mean in fact they  
11 know they disposed of waste at Neal's up to '71 or '72.  
12 But I don't dispute that.

13 MR. CARNEY: That's not right.

14 MR. FELDMAN: No, that's not right.

15 MR. McCREA: You're saying they didn't  
16 dispose of solid PCBs waste --

17 MR. CARNEY: Other than the one load.

18 MR. McCREA: In '71 and '72? I think  
19 there are a number of --

20 MR. FELDMAN: I'd like to continue with  
21 the questioning of Dr. Munson.

22 MR. McCREA: There are a number of  
23 documents that will dispute that.

1 Q You indicate in the next sentence that the procedure --  
2 I assume you mean of disposing of those materials at a  
3 landfill -- was an accepted practice; is that right?

4 A Yes.

5 Q What was your basis for that opinion at that time?

6 A Well, my understanding was that they were doing this  
7 disposal with a state and county permit. Maybe I was  
8 mistaken. But my understanding was they were not  
9 breaking any laws in doing this. This was an accepted  
10 procedure. They had state and county permits to do it.

11 Q When you took BL24 in figure 2 which is the next page  
12 after 4 how did you get into the landfill, into that  
13 property?

14 A I just walked over and took it.

15 Q Do you recall that as you sit here today?

16 A Well, all of these samples, basically. We did not have  
17 anyone with us. We just walked over and took them. In  
18 some cases it meant stepping through a fence to do it.  
19 It looks to me as though the location as pinpointed on  
20 this map is in the little gully actually outside of the  
21 landfill. I don't recall where that is in relation to  
22 the house that sits about in that location.

23 But my guess is one of my notebooks has a sketch

1 map showing it in greater detail. I don't remember.

2 Q You state that judging from the 3.0 parts per million  
3 just below the landfill and the 2.0 parts per million  
4 on the edge of the farm and 2.3 in the downstream  
5 position of Richland Creek, substantial Inerteen  
6 leaches from the landfill, again referring to page 4  
7 there.

8 How do you know that those samples ranging from  
9 2.0 to 3.0 parts per million are not within the range  
10 of error of your methodology, your analytical  
11 methodology?

12 A I'm not quite sure what you mean by range of error.  
13 You're saying that not being able to tell the  
14 difference between 3.0 PPM and .01; is that what you  
15 mean?

16 Q That's right. I asked you earlier whether you could  
17 tell me what the range of error was for that analytical  
18 measure, and you told me you could not?

19 A You asked me about the accuracy. The accuracy is how  
20 close you are to the true value. As far as to the  
21 precision I certainly can tell you. I can tell the  
22 difference between a sample that gives me 3.0 PPM and  
23 one that gives me .01.

1 Q Well, I thought I asked you what the plus or minus  
2 variable was for the result that you get, in other  
3 words, what your confidence range is for those numbers.

4 A I thought you asked me accuracy. Basically I don't  
5 remember the exact number. But we did do some samples  
6 in duplicate. And I certainly am confident that I  
7 could tell the difference between 3.0 PPM and 2.3 PPM.

8 Q Did you do these samples in duplicate?

9 A I don't remember.

10 Q Do you know how long before you did these samples you  
11 did the last duplicate samples?

12 A How would I know. I don't have the notebooks. All I  
13 have is the data in this report.

14 Q So, the answer is you don't know?

15 A I don't know.

16 Q How frequently did you do duplicate samples?

17 A I really don't remember.

18 Q How can you tell me you are confident that you can tell  
19 the difference between 3.0 parts per million and .01  
20 parts per million?

21 MR. MCCREA: To which I will object. This  
22 question has been explained in an hour and a half or  
23 two hours of testimony. He's described the procedures.

1 Furthermore, Westinghouse has never challenged the  
2 accuracy of these test results in 17 years. The  
3 information stands as written. If Westinghouse had  
4 challenged the accuracy of this information, I assume  
5 that the author of the information would have been  
6 contacted with respect to the accuracy thereof.

7 In that he never was contacted, it must be  
8 accepted that the accuracy of this is not challenged by  
9 Westinghouse.

10 MR. FELDMAN: Where is that written?

11 MR. McCREA: That's not written.

12 A It's simple logic. A small leap.

13 MR. FELDMAN: That's not my logic.

14 MR. McCREA: I think, Jan, we've got areas  
15 of information that you could be going into rather than  
16 this which would be more productive. If you say this  
17 is not accurate, fine. Bring somebody in to explain  
18 that. But it would seem odd to me in 17 years you  
19 never contacted Dr. Munson to ask him about the  
20 accuracy or inaccuracy. And this report is obviously a  
21 critical report with respect to what Westinghouse knew  
22 about the Bloomington information.

23 So, if your position is it's inaccurate, I find

1 that hard to accept in that he was never contacted to  
2 explain the methodology.

3 MR. FELDMAN: Is it possible to get back  
4 to my question?

5 MR. McCREA: What I'm saying is your  
6 question is unnecessarily prolonging this deposition,  
7 Jan.

8 MR. FELDMAN: David, Dr. Munson produced a  
9 report which you intend to produce into evidence to the  
10 extent it is relevant. And I am asking the only person  
11 that I could possibly ask as to the accuracy of these  
12 numbers. There is no one else I can ask about it  
13 because he's the only person that is capable of  
14 testifying to it. And he's certainly the one you will  
15 have at trial on it.

16 I can't imagine why I shouldn't be allowed to  
17 probe into the area of the accuracy of these samples.

18 MR. McCREA: Proceed.

19 (The Reporter complied with Counsel's request and  
20 read as directed.)

21 A Well, all I can say is we analyzed a lot of samples.  
22 We did various quality control procedures such as doing  
23 samples in duplicate. The difference between .01 and



1 2.5, you're talking about a 250-fold difference. That  
2 means if the .01 gives you peaks this tall on the  
3 chromatograph, the other one gives you peaks that go  
4 through the ceiling. I don't see how you could fail to  
5 notice the difference.

6 Now, in terms of whether the 2.5 is 2.5 plus or  
7 minus .1, without going back to the notebooks and  
8 looking at all the things we did at the time, I can't  
9 tell you the answer to that question. I don't know.

10 Q You're referring to 2.5. I don't see where you're --

11 A Well, I'm pulling a sample out of the air. Say a  
12 sample 2.3 parts per million.. If you want to know  
13 whether that's 2.3 plus or minus .1, 20 years later I  
14 can't tell you the answer to that. But I can certainly  
15 tell you that I am absolutely confident that I could  
16 tell the difference between that sample and the 2.0 or  
17 the 3.0 sample or the 7.2 sample.

18 Q Doctor, look at figure 3, and then if you would back on  
19 page 6 where you were explaining the data on figure 3,  
20 you indicate that none of these samples -- and I assume  
21 you mean those reflected in figure 3; is that right? --  
22 is alarmingly high?

23 A Yes.

1 Q You determine that those are five times higher than  
2 what would be expected if aerial fallout had not taken  
3 place. I thought you said that the background level  
4 was .01. Oh, I see. So, you're saying background is  
5 .01 and .05 is five times as big. Is that the point?

6 A Yes.

7 Q And you think even though you can't remember the range  
8 of error in your method that there is a significant  
9 enough difference between .01 and .05 for you to have  
10 confidence in that conclusion?

11 A I think so, yes.

12 Q What is it about .07 or .05 that assures you that those  
13 levels are not alarmingly high?

14 A Well, you have to put this back in the context of which  
15 this report was written. We're talking about movement  
16 of PCBs from a plant that is using tank car quantities.  
17 Okay. So, while at the time I saw .07 and .05 as being  
18 higher than I expect by background. it's not --

19 Q Tank car quantities?

20 A Tank car quantities. It's not as high as we saw  
21 downstream from Neal's Landfill. It's not as high as  
22 we saw in the sample from the sewage treatment plant.

23 Q Do you view the samples around Neal's Landfill as

1        alarmingly high or did you at the time?

2    A    Yes.

3    Q    Why is that? Because they were a hundred times higher  
4        than the ones near the dump, the ones reflected in  
5        figure 3?

6    A    Yes. They're several hundred times higher. If we're  
7        talking about .01 as being a background, 300 times  
8        higher is 3.0.

9    Q    When you say alarmingly high, other than the fact that  
10       it's higher than some other number, what makes it  
11       alarmingly high from any public health point of view?

12   A    Well, I'm speaking from the point of view of potential  
13       for being taken up in the food chain, setting aside  
14       bothering, say, agricultural operations, possibly the  
15       potential of human beings eating animals that are  
16       contaminated. Those to me at the time and still do  
17       look like levels high enough to accumulate up the food  
18       chain.

19   Q    And .01 does not? .05 does not?

20   A    Well, a sediment sample -- I'm sorry -- a soil sample  
21       out in the field, I don't know. If you grew grass  
22       there and fed it to a cow, I would guess you would see  
23       a little PCBs in the cow's milk.

1 Q So, these samples might be alarmingly high, too; is  
2 that right?

3 MR. YOUNG: No.

4 A No. I would expect the level in the cow's milk would  
5 be quite possibly below the alarming limit. It would  
6 be there. But it's a relative term.

7 Q Is there any data that you rely on to become alarmed at  
8 a level of 2.3 or higher than that as potentially  
9 having impact on cows and not be alarmed at .01 or .05?

10 A What can I say. I wrote the report 20 years ago. I  
11 don't remember what data I had at my fingertips at the  
12 time I wrote that. Today I'm alarmed by all of it.

13 Q And is that based upon studies that show that cattle  
14 who live in areas with those kind of levels in the soil  
15 accumulate them at some rate?

16 A I'm thinking more of by accumulation in fish and that  
17 sort of thing.

18 Q But these are not water samples.

19 A No. But these are sediment samples that are going to  
20 find their way into the gullies and streams.

21 Q Do you have any studies that alarm you today relating  
22 to the possible effects on cattle of these kinds of  
23 levels in soil?

1 A I don't have any, no.

2 Q And yet you're still alarmed about it?

3 A I'm alarmed, yes.

4 Q Looking on page 8 --

5 MR. McCREA: Jan, it's 15 after.

6 MR. FELDMAN: Doctor, we have to adjourn  
7 the deposition to meet your airplane schedule, but  
8 we'll have to come up with a date to resume it.

9

10 (The deposition was adjourned at 4:15 o'clock p.m.  
11 to be resumed at a future time to be agreed upon by the  
12 parties.)

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1 STATE OF INDIANA )  
 ) SS:  
2 COUNTY OF MARION )

3 I, Beverly S. Evans, a Notary Public in and for  
4 the County of Marion, State of Indiana at large, do hereby  
5 certify that THOMAS OREN MUNSON, the deponent herein, was  
6 by me first duly sworn to tell the truth, the whole truth  
7 and nothing but the truth in the aforementioned matter;

8                   That the foregoing continued deposition was taken  
9   on behalf of the Defendant at the law offices of Baker &  
10 Daniels, Indiana National Bank Tower, 15th Floor,  
11 Indianapolis, Marion County, Indiana, on the 17th day of  
12 December, 1988, commencing at the hour of 11:00 o'clock  
13 a.m., pursuant to the Federal Rules of Civil Procedure;

14 That said deposition was taken down in Stenograph  
15 notes and afterwards reduced to typewriting under my  
16 direction, and that the typewritten transcript is a true  
17 record of the testimony given by the said deponent;

18                   That the parties were represented by their counsel  
19 as aforementioned.

20 I do further certify that I am a disinterested  
21 person in this cause of action; that I am not a relative or  
22 attorney of any of the parties, or otherwise interested in  
23 the event of this cause of action, and am not in the employ

1 of the attorneys for any of the parties.

2 IN WITNESS WHEREOF, I have hereunto set my hand and  
3 affixed my notarial seal this 20th day of December, 1988.

4

5

6

BEVERLY S. EVANS, Notary Public

7

8 My commission expires:  
September 29, 1990.

9

County of Residence:  
Hancock.

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1 UNITED STATES DISTRICT COURT  
2 SOUTHERN DISTRICT OF INDIANA  
3 INDIANAPOLIS DIVISION

4 DALE CONARD and CONNIE CONARD )

5 Plaintiffs, )

6 -vs-

) CASE NO. IP84-1667-C

7 WESTINGHOUSE ELECTRIC )  
8 CORPORATION, )

9 Defendant. )

10  
11  
12  
13 The continued deposition upon oral examination of  
14 THOMAS OREN MUNSON, a witness produced and sworn before me,  
15 Beverly S. Evans, a Notary Public in and for the County of  
16 Marion, State of Indiana, taken on behalf of the Defendant  
17 at the law offices of Baker & Daniels, Indiana National  
18 Bank Tower, 15th Floor, Indianapolis. Marion County,  
19 Indiana, on the 30th of December, 1988, commencing at the  
20 hour of 10:58 a.m., pursuant to the Federal Rules of Civil  
21 Procedure with written Notice as to time and place.

22 -----  
23 JOHN E. CONNOR & ASSOCIATES, INC.  
1860 ONE AMERICAN SQUARE  
INDIANAPOLIS, IN 46282  
(317) 632-5533



# A P P E A R A N C E S

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1 T H O M A S   O R E N   M U N S O N, having been first duly  
2 sworn to tell the truth, the whole truth and  
3 nothing but the truth, relating to said matter,  
4 was examined and testified as follows:

5  
6 DIRECT EXAMINATION (Continued),

7 QUESTIONS BY MR. JAN FELDMAN:

8 Q Let the record reflect that this is the continued  
9 deposition of T. O. Munson. Dr. Munson, since your  
10 last deposition have you done any more work on this  
11 matter?

12 A I have read one document that was sent to me by David  
13 McCrea. I'm not sure exactly what it's in relation to.  
14 I don't know if he has a copy of it for you or not.

15 MR. McCREA: I should have a copy of it  
16 here somewhere.

17 A (Continuing) A copy apparently of a manual from  
18 Westinghouse instructions for handling Inerteen fluids.

19 MR. FELDMAN: David, do you intend to  
20 provide Dr. Munson with any more documents after today?

21 MR. McCREA: As I get them I may. I just  
22 got this document the day I sent it to him. I had not  
23 seen that document before that day. And it is in the

1        approximate time period that he was doing his work in  
2        the Bloomington area. And these are written policies  
3        of Westinghouse on how to handle the disposal of PCBs  
4        which would be consistent with the work that he was  
5        doing with regard to those practices.

6                    MR. FELDMAN: You don't have any current  
7        intention to send him any more; is that right?

8                    MR. McCREA: Correct.

9                    (Defendant's Deposition Exhibit 25 was marked for  
10       identification.)

11    Q        For the record, Exhibit 25 is a cover letter from David  
12        McCrea to Dr. Thomas O. Munson dated December 21, 1988  
13        with a document, the second page of which is entitled  
14        Instructions for Handling Inerteen Insulating Fluid  
15        P.D.S. 54201 CM.

16                    MR. McCREA: I do have a copy.

17    Q        Just for the record, Doctor, is Exhibit 25 what you  
18        received from Mr. McCrea the other day in the mail?

19    A        Yes, it is.

20    Q        Other than Exhibit 25 have you looked at anything else  
21        in relation to this case or in relation to any other  
22        Westinghouse cases since your last deposition?

23    A        No, I have not.

1 Q Have you had any other meetings with Mr. McCrea or any  
2 other counsel for the Conards since your last  
3 deposition?

4 A No, I have not.

5 Q What about telephone conversations?

6 A I had a conversation last night with David simply  
7 confirming the arrangements for the meeting today and  
8 also a message on my answering machine. Some day last  
9 week he left it.

10 Q What was that concerning?

11 A Same thing, just telling me the date that was set up  
12 for this meeting.

13 Q Do you anticipate doing anything else before the trial  
14 of this case to prepare for your testimony at trial?

15 A I don't think so.

16 Q Has Mr. McCrea or Mr. Young indicated anything to you  
17 in that regard?

18 A No, they haven't.

19 Q Have you read a copy of the transcript of your previous  
20 deposition sessions?

21 A No, I haven't.

22 Q Do you have a copy?

23 A No, I don't.

1 Q Doctor, you don't have a copy. So, the pages won't  
2 mean anything to you. But on page 182 of the second  
3 session of your deposition you indicated that you  
4 believed -- and I'm quoting -- that people near or on  
5 the downwind side of the incinerator are going to be  
6 exposed to levels high enough to cause injuries and  
7 disease.

8 What injuries and disease do you anticipate will  
9 be experienced by people who live in that location?

10 A Well, that's really hard to say. It depends upon  
11 whether my concerns are realized. I'm just  
12 anticipating that from what I have heard described for  
13 the incinerator that the people on the downwind side  
14 will be exposed to PCB in the vapor. As to what sorts  
15 of responses, it's hard to say. I don't know.

16 Q In your previous testimony you indicated that you  
17 thought the incinerator would produce high enough  
18 levels to cause injury and disease. What injuries and  
19 disease did you have in mind that would be caused by  
20 levels of whatever comes out of the incinerator?

21 A Well, I was thinking in terms of perhaps neurological  
22 problems that might be associated with breathing levels  
23 of PCBs over a long-term period.

1 Q What neurological problems are associated with  
2 breathing PCBs over a long period of time?

3 A I'm not entirely sure.

4 Q Are you aware of any neurological diseases or ailments  
5 caused by breathing PCBs over an extended period of  
6 time?

7 A I suspect there are some. I suspect that there are  
8 some that are not documented in the medical literature.  
9 If I recall correctly, you were asking me if I had  
10 concerns. And I was expressing to you my concerns.

11 Q Well, the questioning began with a statement that you  
12 made that says I predict there are going to be  
13 significant injuries from the environmental exposures  
14 to PCBs. And then you indicated that that was based on  
15 your personal experience. And then I asked you what is  
16 the personal experience that that conclusion of yours  
17 is based on. And you said that levels of PCBs from the  
18 incinerator would cause injury and disease.

19 So, that's the basic line of questioning that I  
20 want to ask you to explain. What I'd like to know is  
21 what neurological diseases you believe or believed at  
22 your last deposition would be caused by the levels of  
23 PCBs produced by the incinerator.

1 A That's really hard to say. I think you've established  
2 I'm not a toxicologist or an epidemiologist. I'm  
3 simply an observer of what appears to me to be some of  
4 the problems people working with PCBs have had  
5 medically. I've talked to several individuals. There  
6 have been respiratory problems. People talk about  
7 irritability, things of that nature, personality  
8 changes.

9 Q What is the nature of the personal experience that  
10 leads you to make that prediction?

11 Have you ever been exposed to PCBs that have  
12 caused any problems?

13 A No. No. I was talking in terms of my prediction was  
14 that the incinerator would not be handled properly.  
15 According to the plan that I've heard described is the  
16 incinerator is supposed to be zero discharge PCBs. My  
17 prediction is it will not be.

18 Q What is your prediction as to the level of PCBs that  
19 the incinerator will discharge?

20 A Well, I don't know. My prediction is that there will  
21 certainly be some that will not be zero discharge. It  
22 could be most anything, depending upon how serious the  
23 situation gets.



1 Q You don't know what the levels are, but you know  
2 they're high enough to cause injury and disease?

3 A I'm guessing. You asked me for my prediction, and  
4 that's my prediction.

5 Q Have you reviewed any materials as to the function of  
6 the incinerator and the likely discharge of PCBs as  
7 by-products of the incinerator?

8 A I have not seen written plans for the incinerator, no.  
9 It has been described to me.

10 Q Who described it to you?

11 A I think Mr. McCrea, for one, I believe. I can't  
12 remember. I've been present at several discussions  
13 where the incinerator was talked about. I know  
14 basically the plan involves providing the heat for the  
15 incineration from the pyrolysis of sanitary waste. I  
16 believe, or essentially municipal refuse.

17 Q You don't consider yourself an expert in the  
18 by-products of incineration of materials in this kind  
19 of a device, do you?

20 A Not particularly, no.

21 Q Also, I interrupted you in an answer to a question at  
22 your last deposition. That always comes back to haunt  
23 you. You said -- And I'm quoting -- "I have spoken to

1 at least" --

2 MR. McCREA: Page, please.

3 Q Page 183. "I have spoken to at least one individual  
4 who worked at the Westinghouse plant. I've been told,"  
5 and that's when I cut you off. The question that  
6 prompted that was a question about whether you know of  
7 any individual who sustained personal injuries as a  
8 result of environmental exposure to PCBs.

9 My question now is: Who did you talk to at the  
10 Westinghouse plant that you were referring to in that  
11 answer?

12 A Well, I didn't talk to the man at the plant. I met  
13 this particular individual -- And I'm having trouble  
14 remembering his name -- one evening at Mr. McCrea's  
15 house.

16 Q Is it Jason Morrow?

17 A Perhaps.

18 THE WITNESS: Was that Jason Morrow?

19 MR. McCREA: No. Mont Toon, I believe.

20 A (Continuing) The fellow who needs oxygen.

21 MR. McCREA: Yes. First name is Mont,  
22 M-o-n-t, last name Toon, T-o-o-n.

23 Q Now, this was a person that Mr. McCrea had brought to

1 his house to meet you; is that correct?

2 A I believe Mr. Toon came on his own. He and his wife  
3 came to an evening get-together at Mr. McCrea's house.

4 Q Was this on your first trip to Bloomington when you  
5 were there with your wife?

6 A Yes.

7 Q And who else was at the get-together at Mr. McCrea's  
8 house?

9 A Oh, my. It was quite a group of people. I don't  
10 remember them all. In fact, I don't remember hardly  
11 any of them. Vernice Lockridge was there. Her husband  
12 wrote Rain Tree County, a great American novel. The  
13 brother of the Dalai Lama was there and his wife.

14 Q Was this a party that Mr. McCrea had arranged and you  
15 happened to come to it or was it a party that was  
16 arranged for you to be at?

17 A I think the latter case. He invited some people over  
18 that he thought I might like to meet and who might like  
19 to meet my wife and I. And we got together out on the  
20 patio and had a couple of beers and hors d'oeuvres.  
21 David's mother was there as hostess. I forgot that.

22 Q Can you recall the names of any other people at the  
23 party?

1 A Let's see. I think it was Stu Curry was there, I  
2 think. David McCrea was there, of course. No, I don't  
3 remember any of the other people.

4 Q Any governmental officials?

5 A Governmental. There was one person who I recall as  
6 being part of the local government, I think. I don't  
7 remember. He was some kind of a politician of some  
8 sort or another.

9 Q Do you recall whether there were any other clients of  
10 Mr. McCrea that were at the party?

11 A I don't know.

12 Q No one was introduced to you as such?

13 A No.

14 Q What did you talk about with Mr. Toon?

15 A Oh, let's see.

16 Q By the way, were the Conards there?

17 A I don't believe so. I'm trying to remember. We talked  
18 a little bit about the Westinghouse plant. And I  
19 mentioned to him having done some sampling around. I  
20 can't remember what else specifically. He talked about  
21 some of the record keeping for PCBs and the fact that  
22 the records were all gathered up and removed from  
23 people's files.

1 Q Now, I asked you the question at the previous  
2 deposition as to whether you were aware of anyone who  
3 had sustained personal injury as a result of  
4 environmental exposure to PCBs. And that was when you  
5 started speaking about what you have now identified as  
6 Mr. Toon.

7 Did Mr. Toon indicate to you that he had been  
8 injured from PCB exposure?

9 A I'm pretty sure that we talked about that. He  
10 certainly feels that his illnesses have been caused by  
11 his exposure to PCBs. He is medically in pretty bad  
12 shape, I understand.

13 Q What are his illnesses?

14 A Well, I don't remember all of them specifically. He  
15 has very brittle bones, for one thing, I think, that  
16 break very easily. He also has some severe respiratory  
17 problems. He has to spend a lot of time inhaling  
18 oxygen. Other than that I'm not really familiar with  
19 all of them. We didn't really -- I mean the thrust of  
20 our conversation wasn't going over his medical  
21 problems.

22 Q I thought it was. What was the thrust of your  
23 conversation with Mr. Toon?

1 A Well, it was meeting him, him meeting me. We talked  
2 about a number of things. And I don't know that that  
3 was the purpose for him being there or my being there.  
4 He was just one of the people, and I met him and I  
5 realized he was the person that David had talked to me  
6 about as one of the people who used to work at the  
7 plant who now was in very bad shape medically.

8 Q Did Mr. McCrea indicate to you that he thought that Mr.  
9 Toon's problems resulted from his exposure to PCBs at  
10 the Westinghouse plant?

11 A Oh, certainly.

12 Q I take it Mr. Toon said that as well?

13 A Yes, he believes that as well.

14 Q Did either of those two or anyone else tell you about  
15 whether any physicians had made such a connection  
16 between Mr. Toon's problems and his exposure to PCBs?

17 A I don't remember whether anyone says that or not.

18 Q Did you draw any conclusions as to whether Mr. Toon's  
19 problems resulted from the exposure to PCBs?

20 A Well, I think it's highly likely. But, you know, I  
21 certainly can't prove that in court. I'm not sure  
22 anyone can.

23 Q And that connection that you concluded as to whether

1 his exposure to PCBs caused his physical problems is  
2 not an area that you profess to have any expertise; is  
3 that right?

4 A That is true.

5 Q On 184 of your second deposition you referred to women  
6 who were emotionally damaged because they couldn't  
7 breast-feed infants because of PCBs.

8 Do you recall that testimony?

9 A Yes.

10 Q I'd like to know what women you are referring to.

11 A I was referring to information I had -- I can't  
12 remember whether I read it or heard it -- presented at  
13 a conference that included PCBs. It was a study that  
14 was done some years ago of sampling mothers' breast  
15 milk across the United States and finding it higher  
16 than the allowable limit for cow's milk for sale,  
17 higher than the FDA limit, I believe, of 5 parts per  
18 million.

19 And many of these women were counseled by their  
20 doctors not to breast-feed their infants.

21 Q Do you remember who conducted the study?

22 A No, I don't. I believe it was a federal study.

23 Q Did anyone study whether they had sustained emotional

1 damage as a result of that experience?

2 A Oh, I don't know. That may well be my step of logic  
3 there.

4 Q So, that's not based on any review of the literature or  
5 any personal studies that you made?

6 A No. That was my example of persons whose lives had  
7 been damaged by their exposure to PCBs.

8 Q You said that the limit in cow's milk under the FDA  
9 standards is 5 parts per million; is that correct?

10 A I'm not sure what it is today.

11 Q At one point it was 5 parts per million?

12 A At one time it was 5 parts per million.

13 Q In your last deposition we introduced the Exhibit 23  
14 which was the preliminary proposal to the Environmental  
15 Protection Agency. Do you recall that?

16 A Yes, I do.

17 Q Do you have a set of exhibits with you today?

18 A I don't remember if I came away with a copy of that one  
19 or not. I don't believe I got a copy of that.

20 Q Well, you may not need it for this question. Was it  
21 common for Westinghouse to make proposals to the EPA  
22 for projects which the EPA might fund or might be  
23 jointly funded by EPA and Westinghouse in the early



1 '70s?

2 A I believe so.

3 Q So, this was not the first proposal, to your knowledge,  
4 that Westinghouse made to the EPA for investigation of  
5 environmental problems; is that right?

6 A No.

7 Q Were there others that were made after this one that  
8 you are aware of, other proposals to the EPA?

9 A I'm pretty sure there were. I remember visiting an EPA  
10 office. It would have been after this date, I think,  
11 with John Kelly to discuss a potential program.

12 Q Would the EPA ever come to Westinghouse with studies  
13 that it would like Westinghouse to conduct on its  
14 behalf?

15 A I don't remember that happening at the Ocean Research  
16 Laboratory. The Westinghouse R and D laboratory in  
17 Pittsburgh, possibly. I know they had several studies  
18 going on having to do with waste disposal and things of  
19 that nature. I don't remember who was funding those or  
20 who initiated them. But such proposals going to EPA  
21 would not have been unusual.

22 Q The proprietary class 1 stamp that appeared on at least  
23 some of the copies of your report, is it your

1 understanding that that stamp appeared on other  
2 documents other than your report?

3 A Yes.

4 Q Did it appear on other documents other than your  
5 sampling work at other plants?

6 A I'm sorry. The documents that I generated or --

7 Q Well, whether or not you generated them, are you aware  
8 of whether other documents at Westinghouse were stamped  
9 proprietary class 1 other than documents relating to  
10 your sampling programs?

11 A Oh, yes.

12 Q Was it fairly common for that stamp to be used on  
13 documents at least initially?

14 A Documents that were considered containing information  
15 which needed to be closely held, yes. That's what the  
16 stamp is for. It's like top secret in the military.

17 Q And is it your understanding that documents that were  
18 stamped class 1 initially in some instances were  
19 subsequently disclosed to the public?

20 A I believe so.

21 Q Was that a common phenomenon, as far as your knowledge  
22 goes?

23 A I have no way of knowing that.

1 Q Do you remember whether any of the documents that you  
2 caused to be stamped with the proprietary class 1 stamp  
3 were ultimately disclosed to the general public?

4 A I know of one document that I was told was disclosed to  
5 I believe some officials from the state of Virginia.  
6 Now, whether that was ever made known to the general  
7 public, I don't know. But the report I generated for  
8 the South Boston plant -- I think I mentioned that  
9 earlier -- my understanding was that report was at  
10 least shown. Whether it was given, I don't know, but  
11 it was shown to the state officials.

12 Q Can you think of any others, whether they were shown to  
13 the general public, that at least were shown to people  
14 outside of Westinghouse?

15 A That's the only one I am aware of. I'm sorry.  
16 Obviously some of them were. I mean the Bloomington  
17 report came to David through outside Westinghouse  
18 channels. So, clearly that report was produced at some  
19 point.

20 Q Which brings me to my next question. Did Mr. McCrea  
21 tell you where he got a copy of the preliminary report  
22 relating to the Bloomington plant?

23 A I'm not sure I can quote it exactly. But if I am

1 remembering correctly -- I'm sure he told me. Now,  
2 whether I can remember what he told me is something  
3 else. But I believe he said it came from an  
4 administrative law judge's files somewhere. David  
5 could correct me.

6 Q When was the last time you did any laboratory analysis  
7 for PCBs or other chlorinated compounds?

8 A Other chlorinated compounds opens the door pretty wide.

9 Q Why don't we start with PCBs.

10 A The last time I did a PCB analysis with my own hands  
11 would probably have been about the time I left  
12 Westinghouse in '76. Others did them under my  
13 supervision while I was at EPA say through '82. They  
14 were being done routinely in the laboratory.

15 Q None after 1982?

16 A After '82, I went to the FBI after '82.

17 Q And did no PCB analysis there?

18 A And did no PCB analysis.

19 Q You did some gas chromatography at the FBI; is that  
20 right?

21 A I did a lot of gas chromatography and GC/MS.

22 Q Did any of that involve PCBs or pesticides or dioxins  
23 or benzofurans?

1 A No.

2 Q Does the EPA currently, to your knowledge, have a  
3 published method for detecting PCBs in various kinds of  
4 media?

5 A Sure.

6 Q Do you have a copy of that in your files back in  
7 Minnesota?

8 A I'm not sure. I don't believe the method has changed  
9 since I was at EPA. And in my files somewhere I think  
10 I have the EPA -- it's called the Federal Register  
11 method because that's where it's published. Federal  
12 Register. I think I have the Federal Register method  
13 for PCBs somewhere in my files.

14 Q To your knowledge, is any part of the Federal Register  
15 method based on work that you did either at  
16 Westinghouse or at EPA?

17 A I don't think specifically that it is, no.

18 Q In your 1976 testimony you discussed methodology for  
19 testing for PCBs in the laboratory; is that right?

20 A Which testimony was this you are referring to?

21 Q The testimony you provided on behalf of the EPA when  
22 you were working there. I said '76. That may be a  
23 wrong date. I think that that was right.

1 A I think you're right. That was the PCB registry  
2 hearing, I think, the one that lasted -- I think I  
3 testified for a whole day and then worked as a  
4 consultant for maybe five or ten days. I can't  
5 remember exactly. I can't remember whether I  
6 specifically testified about methodology. I believe  
7 EPA wanted me to testify because of the information  
8 that I had published on PCBs in the Chesapeake Bay.

9 Q You didn't propose a methodology for testing for very  
10 low levels of PCBs at those hearings?

11 A You're remembering correctly. I'm not remembering  
12 correctly. Yes. That's right. One of the things I  
13 did was I provided a deposition to Ridgway Hall, the  
14 EPA attorney, where I mentioned the feasibility of  
15 measuring PCBs at very low level. I don't recall that  
16 being part of my testimony.

17 I believe that Ridgway Hall took a deposition from  
18 me on that subject and from Dr. Gilman Vieth,  
19 V-i-e-t-h, I think, who was from the EPA laboratory in  
20 Duluth. Why he did that I'm not sure. But I think my  
21 testimony --

22 Q You don't recall being cross-examined by  
23 representatives of various industries relating to the

1 feasibility of measuring PCBs and the percentages of  
2 parts per billion or lower?

3 A I don't remember that. But, you know, that testimony  
4 was a long time ago.

5 Q Is it correct to say, whether or not you testified as  
6 to those methods at this hearing, that you have  
7 developed certain methodologies for testing at low  
8 levels for PCBs in the parts per billion, parts per  
9 trillion?

10 A Yes. That's correct.

11 Q To your knowledge, has the EPA adopted your  
12 methodologies for testing at those levels as the  
13 accepted methodology to be used to comply with their  
14 own regulations and standards?

15 A I don't think so.

16 Q Do you know whether any governmental body other than  
17 the EPA has adopted your methodologies?

18 A Not that I am aware of.

19 Q Is it fair to describe the purpose as you understood it  
20 of the sampling in Bloomington to be to locate deposits  
21 of PCBs in the Bloomington area, if they existed, that  
22 might be related to Westinghouse?

23 Let's start with that. Was that part of the

1 purpose of the study as you understood it?

2 A I don't think we were searching for deposits. We knew  
3 where the PCBs had been placed. What we were  
4 interested in was the amount of movement of PCBs from  
5 the plant as one source of PCBs and the movement of  
6 PCBs to what extent they moved from the landfill sites  
7 that had been used.

8 Q All right. And was it another part of the purpose of  
9 your study to determine what could be done to reduce  
10 movement like that in the future such as corrective  
11 measures at the plant or using better landfills?

12 A That really wasn't a part of the study, to determine  
13 those measures. Hopefully the data from the study  
14 would indicate where such measures were necessary. It  
15 was my understanding that if there were problem areas,  
16 we could perhaps identify them with the study so that  
17 Westinghouse could take remedial action.

18 Q By remedial action I understand you to mean if PCBs are  
19 escaping from landfills that Westinghouse will use  
20 different or not use landfills at all in the future; is  
21 that correct?

22 Or was that laid out for you at that time?

23 A Well, I'm not sure that was really laid out. At the



1       time I sampled we were taking a fairly simpleminded  
2       approach as far as doing enough sampling to get an idea  
3       if there was a serious situation and if there were, how  
4       serious was it.

5   Q   The different kinds of possible remedial measures that  
6       might be taken -- You mentioned some in the plant  
7       itself -- excluding those for the moment, as a result  
8       of the results that you found in the environment  
9       weren't discussed either before or after the report was  
10      made; is that right?

11   A   I don't remember any that I was involved with.

12   Q   I think we discussed in one of the previous sessions a  
13       geographical mistake that you had made in the report  
14       relating, I believe, to Clear Creek and whether it fed  
15       into the Monroe Reservoir. Do you recall that?

16   A   Yes.

17   Q   Other than that did you learn of any other mistakes in  
18       your report after you wrote it and sent it to people at  
19       the plant?

20   A   I'd like to mention that mistake with Clear Creek, I  
21       didn't learn about that mistake until this year. No  
22       one pointed that out to me at the time. And I don't  
23       quite know why. But no, I'm not aware of any other

1 mistakes that are in the report.

2 Q You said that no one had pointed out the Clear Creek  
3 mistake to you in 1972, '71?

4 A No.

5 Q I take it the same is true on any other mistakes, if  
6 there are any, in the report?

7 A I don't recall anyone pointing out any mistakes in the  
8 report.

9 Q Where did you actually type the report or write it?

10 Where were you when you did that?

11 A That would have been at the Ocean Research Laboratory.  
12 Actually the sight is at Bay Bridge, Maryland. It's  
13 near Annapolis, Maryland.

14 Q Do you remember how long a period of time there was  
15 between when you finished your sampling and the results  
16 were back from the laboratories, between that point and  
17 when that report was finally completed and forwarded to  
18 Westinghouse in Bloomington?

19 A No, I don't. I've tried to reconstruct that period.  
20 But in the absence of my notebooks I really can't do  
21 it.

22 Q And you still can't recall anything about the actual  
23 sending of the report or delivering it to Westinghouse

1 in Bloomington?

2 A Yes. I don't remember if I sent the report to them and  
3 then traveled out for a meeting or whether I traveled  
4 for the meeting hand carrying all the copies and  
5 distributed them around the table. I know there was a  
6 meeting.

7 Q Was there any communication with anyone at the  
8 Bloomington plant while you were out of state preparing  
9 a report?

10 A I can't remember. There may well have been. But I  
11 just can't remember.

12 Q Do you remember whether the report was delivered in a  
13 timely fashion?

14 A As soon as I had the results I would have put the  
15 report together. But as to how long that took, whether  
16 we carried the samples right back to the lab and  
17 analyzed them in a few weeks or whether it took six  
18 months, I don't know because I can't reconstruct what  
19 we were doing at the time. It was a busy period. It  
20 could have taken some time before the analysis was  
21 complete.

22 Q Could it have taken as long as six months?

23 A Possibly. I just don't remember whether we tried to

1 sample as many sites as possible during a particular  
2 time frame and then do the analysis. I am fairly sure  
3 that we sampled South Boston, Sharon and Bloomington  
4 within the same spring through fall period, spring,  
5 summer, fall period. My recollection is that's what we  
6 did. But we did sample several of the sites more than  
7 once.

8 Q Have you ever read any reports or studies that have  
9 been published on the subject matter of the presence of  
10 levels of PCBs in various locations?

11 A I'm sure I have, yes.

12 Q Do reports like that that are useful in the scientific  
13 community generally include a description of the  
14 sampling methodology?

15 A Yes.

16 Q Do they generally include a description of the quality  
17 control methods?

18 A Depends upon the audience of the report. If it's  
19 published in a scientific journal, yes.

20 Q Will it generally include a description of the method  
21 detection limit of the analytical techniques being  
22 utilized in the laboratory?

23 A It depends. Sometimes they do, sometimes they don't.

1 Q Will it include a description of how many samples were  
2 taken usually?

3 A Usually, yes.

4 Q Will it include a description of the efforts taken to  
5 ensure the integrity of the samples from the point  
6 where they're taken to the point where they're measured  
7 in the laboratory?

8 A Once again, it depends upon the audience how much  
9 detail is put into a report.

10 Q Well, if they're going to be used in the scientific  
11 community, would they generally include that kind of  
12 information?

13 A Sometimes they do and sometimes they don't.

14 Q If such reports include conclusions about subject  
15 matters other than the one being tested for, namely,  
16 whether there is a level of PCBs in a particular sample  
17 or not, would there generally be a bibliography to cite  
18 the source of those other conclusions?

19 A In scientific journals, sure, there's usually  
20 references cited.

21 Q Isn't there kind of a form that scientific articles  
22 like that usually follow that's actually published  
23 somewhere? Am I wrong about that?

1 A No. Each scientific journal usually publishes once a  
2 year -- And they call it different things --  
3 information for authors or something like that in which  
4 they specifically spell out their policy about format,  
5 style, how things are going to be abbreviated and  
6 referred to.

7 Q In your second deposition session at 269, for the  
8 record, you indicated that you didn't do any round  
9 robin quality control in the samples you had taken?

10 A In the Westinghouse study? Right. I couldn't.

11 Q You didn't?

12 A I did not, yes. That's true.

13 Q Then you said just like you're saying now that you  
14 couldn't. Why would it have been impossible to send  
15 samples to independent laboratories without identifying  
16 where they came from to let those other laboratories  
17 confirm or deny the levels that you were finding in the  
18 samples?

19 A I suppose it might have been possible. At that time  
20 there were not many reliable commercial laboratories  
21 available to a person in 1971 or '72, not like there  
22 are today. But it might have been possible to do that.

23 Q Did anyone tell you not to do that?

1 A I don't suppose we ever discussed it. I don't recall  
2 anyone telling me not to do that.

3 Q Did anyone tell you not to describe the quality control  
4 measures that you used in the sampling around  
5 Bloomington in your report?

6 A No.

7 Q Did anyone tell you not to include references to  
8 articles that would support some of the conclusions you  
9 reached concerning reproductive problems or  
10 bio-accumulation or those kinds of conclusions that you  
11 have in that report?

12 A No. I made the decision of what the format of the  
13 report was going to be based on the audience for whom  
14 it was intended.

15 Q I take it no one told you not to include a description  
16 of the methodology used at taking the samples or in  
17 analyzing them in the report?

18 A That's true.

19 Q Was it your understanding that the individuals at the  
20 Bloomington plant who would read this report had no  
21 experience in reading scientific journals?

22 A Some of them may have. Some of them probably did not.

23 Q Did you know for a fact that some of them did?

1 A No.

2 Q Was it your understanding that none of them had that  
3 kind of background in reading scientific journals?

4 A I had no understanding one way or the other.

5 Q I take it you didn't ask any of the people at the  
6 Bloomington plant the kind of format that would be  
7 appropriate to --

8 MR. MCCREA: Asked and answered.

9 MR. FELDMAN: No. It's a completely  
10 different question.

11 Q You didn't ask anyone at the Bloomington plant what  
12 kind of format they would prefer for your report; is  
13 that right?

14 A No, I did not. I made up my mind what was the  
15 appropriate format and wrote the report accordingly.

16 Q Did you have any meetings with individuals from  
17 Monsanto that you were in attendance as well as other  
18 people from Westinghouse?

19 A Yes.

20 Q Were those in St. Louis?

21 A There was one in St. Louis.

22 Q Where were the others?

23 A Well, I don't remember them. There were at least half



1 a dozen occasions where I saw Mr. Pappageorge at  
2 scientific meetings, Mr. Pappageorge from Monsanto. I  
3 met once with Dr. Tucker from Monsanto at St. Louis,  
4 but I can't remember whether it was different from a  
5 general meeting I went to in St. Louis. And I  
6 encountered him several times at scientific meetings as  
7 well.

8 Q I have a document that was produced at your first  
9 deposition labeled Exhibit M which refers to that  
10 letter in what we have marked as your deposition  
11 Exhibit No. 3, a list of exhibits.

12 A I have it.

13 Q Do you recall that meeting that's reflected in the  
14 memorandum?

15 I call it a memorandum. It's entitled meeting  
16 with Monsanto on Inerteen December 16, 1972 in St.  
17 Louis.

18 A I dimly recall that meeting, yes.

19 Q It indicates you were in attendance. You don't think  
20 that's incorrect, do you?

21 A I was in attendance.

22 Q What was the nature of your work at that time that led  
23 you to being in attendance at that meeting?

1 A Well, at that time I was analyzing samples for  
2 pesticides and PCBs. I believe that I had already  
3 sampled several Westinghouse plants.

4 Q Do you recall what the purpose of the meeting was?

5 A Other than what's in this memo, I don't remember much  
6 about the specifics of the meeting.

7 Q Do you know where you obtained this document, Exhibit M  
8 referred to on Exhibit 3 of your deposition?

9 A From Mr. McCrea.

10 Q Do you know where he got it?

11 A No, I don't.

12 Q And you can't recall anything further about the purpose  
13 of the meeting other than what you've told us; is that  
14 right?

15 A No, other than what you might deduce from reading these  
16 pages. I don't remember any specifics about the  
17 meeting.

18 Q I think you answered this, but I just want to be sure  
19 I've got it right. You said there were other meetings  
20 other than the one referred to in Exhibit M where you  
21 on behalf of Westinghouse had a meeting with people  
22 with Monsanto. Is that correct?

23 I don't want chance meetings with people from

1 Monsanto.

2 A I met on one occasion with the person referred to here  
3 as Scott Tucker. That was Dr. Scott Tucker who was  
4 their analytical chemist. I met with him in his  
5 laboratory. And I don't recall whether it was on this  
6 trip in December of '71 or whether it was earlier or  
7 later.

8 Q Is it your understanding that during this period around  
9 December 16, 1971 that Westinghouse was attempting to  
10 control or reduce the escape of PCBs into the  
11 environment from its plants and that that was one of  
12 the reasons why this meeting with Monsanto occurred?

13 A That sounds reasonable. Some of the memos I have read  
14 that are here do indicate that some individuals were  
15 attempting to do that at Westinghouse.

16 Q Was there also, to your knowledge at that time, an  
17 effort by Westinghouse to acquire the data that existed  
18 on the environmental effects of PCBs?

19 A I don't know whether that was true or not. I think so.  
20 I believe that Ed Boquist at headquarters had that  
21 interest as part of his job.

22 Q Are you aware of any efforts that were being made at  
23 the Bloomington plant in 1971 and later to find methods

1 to reduce the escape of PCBs into the environment?

2 A From the memos I have read in preparation for this  
3 deposition, it appears that that was taking place.  
4 There had been a study which I don't believe the  
5 Bloomington people mentioned to me at the time, but one  
6 of these documents indicates that there was a study  
7 done by a Westinghouse group called Aquatechnics.

8 And from my own report it appears that some change  
9 had recently been made I believe in the can washing  
10 process or the manufacturing process of the capacitors.  
11 But I can't remember today what that change was.

12 Q All right. From reading your report, even if you don't  
13 have any independent recollection of it, you have  
14 concluded that individuals at the Bloomington plant  
15 discussed with you measures that they had taken to  
16 change the process in F-30 to reduce the loss of PCBs  
17 in the environment; is that right?

18 A I have concluded that at least something was discussed  
19 in that regard. I don't remember them mentioning the  
20 Aquatechnics study and what it was about. I think I  
21 would have remembered that if they had done it. That  
22 came as a surprise to me when I was reading some of the  
23 documents I have been supplied.

1 Q You say it came as a surprise to you. Did it conflict  
2 with some conclusion that you had previously reached as  
3 to the efforts being taken at the Bloomington plant to  
4 reduce the escape of PCBs into the environment?

5 A No. The surprise came that Acquatechnics had been  
6 involved. And that really goes back to some  
7 politicking that was going on as to which group within  
8 Westinghouse was going to spearhead the environmental  
9 effort. And John Kelly's plan was that it would be our  
10 group. Acquatechnics was a group that was apparently  
11 doing some of that kind of work as well. But I never  
12 actually found out what they were doing.

13 I became familiar with the Westinghouse  
14 environmental systems division group who were also in  
15 competition with us or so we perceived it.

16 Q Had you seen the document that is labeled Exhibit H to  
17 the list of exhibits that we've marked as your  
18 Deposition Exhibit No. 3?

19 And for the record I'll identify that as memo from  
20 J. C. Rissinger, R-i-s-s-i-n-g-e-r, dated January 12,  
21 1971 to, among other people, R. D. McClain with an  
22 eight-page attachment. I don't know if I asked a  
23 question in all that.

1           My question about this document that I have just  
2 identified is: Were you aware of the existence of this  
3 document at or about the time it was written?

4 A I don't think so.

5 Q Were you not supplied with the information that  
6 Westinghouse was accumulating in the early '70s about  
7 PCBs from Monsanto and other sources?

8 A No, I was not.

9 Q Now, looking at the memo that's got the H on it dated  
10 January 12, 1971 -- Let's mark this whole thing as an  
11 exhibit.

12           MR. FELDMAN: For the record, Exhibit 3 to  
13 Dr. Munson's deposition dated 11-30-88 was just a  
14 single page and referred to documents from A through V  
15 with one deletion. And what we are going to do with  
16 stipulation of counsel is to insert the references on  
17 the exhibit list of Exhibit 3 so we will have documents  
18 A through V with one deletion that will now become part  
19 of Exhibit 3.

20           Is that okay, David?

21           MR. McCREA: That's agreeable.

22 Q My question was: On Subexhibit H, the memo dated  
23 January 12, 1971 and the attachment to it, did you see

1 that memo and the attachment at or about the time it  
2 was written?

3 A And I answered.

4 Q Your answer was no?

5 A My answer was no.

6 Q Did you discuss any of the attachment to Subexhibit H  
7 with any of the individuals at the Bloomington plant?

8 Whether you saw the document itself, did you  
9 discuss any of the things that are discussed in this  
10 attachment with anyone from the plant?

11 A Oh, well, I suspect so, talking about persistence and  
12 toxicity and that sort of thing, yes.

13 Q You do have recollections of talking about that with  
14 people from the plant?

15 A I don't have specific recollections of such a  
16 conversation, no. But I would naturally have talked  
17 about those things in the discussion of the report that  
18 I carried to them because that was what my concern was,  
19 persistence, toxtotoxicity, bio-accumulation, that sort  
20 of thing.

21 Q In your report there's a mention of a change from one  
22 of Neal's landfills to another landfill. Do you recall  
23 that?

1 A Yes.

2 Q Other than that effort do you have any recollection as  
3 you sit here today of discussions with people at the  
4 Bloomington plant about other efforts they were taking  
5 to reduce the escape of PCBs to the environment?

6 A Well, I had a number of conversations with Lew Shoaff.  
7 After I left the plant Lew was the person I talked to  
8 most frequently. And I believe his function was to see  
9 that the solid waste leaving the plant or the waste,  
10 whatever form it was, that was going to the landfill  
11 went to the landfill. And he sent me samples. I  
12 believe his concern was whether the landfill that was  
13 currently being used was being operated properly. I  
14 know I had discussions with Lew Shoaff in that regard.

15 Q What about measures taken in and around the plant  
16 itself to reduce the loss of PCBs into the environment?

17 Do you have any recollections of discussions about  
18 that?

19 A I don't have a specific recollection about that. I  
20 mean other than I suggested to them to do something to  
21 eliminate the movement of PCBs, the passage of PCBs, to  
22 the sewage treatment plant.

23 Q That was your lunch with John Brittain?



1 A In the plant effluent. I remember at lunch where he  
2 told me they were not going to take those. I'm not  
3 sure whether -- It was probably earlier where I  
4 suggested to them they should do that.

5 Q Looking at Exhibit O, Subexhibit O to your Deposition  
6 Exhibit 3 which is a memorandum dated November 17,  
7 1970, I just ask you to review that to yourself for a  
8 moment.

9 A Okay.

10 Q I take it you have no recollection of seeing that  
11 document in the early 1970s?

12 A No, I'm sure I wouldn't have seen that document  
13 because this is the document where Acquatechnics is  
14 mentioned.

15 Q Other than the Acquatechnics study do you have any  
16 recollection of seeing or of discussing any of the  
17 measures that are mentioned in this Subexhibit O to  
18 Exhibit 3 with anyone from the Bloomington plant in the  
19 early 1970s?

20 A No, I really don't.

21 Q Is it fair to say that you didn't know about any of  
22 these efforts that have been undertaken as of November  
23 17, 1970 to reduce the loss of PCBs to the environment

1 from the plant?

2 A To the best of my recollection, that would be fair to  
3 say except I've got this nagging problem that in that  
4 report I wrote there's a sentence that indicates that  
5 they had made some changes. And somebody had to have  
6 told me something that some changes had been made. And  
7 I just have no recollection of what that was.

8 I'm pretty sure that the specifics that were going  
9 on here described in this memo were not discussed with  
10 me.

11 Q Did you have any discussions with Mr. McCrea about the  
12 relevance of any of the documents that are listed on  
13 Exhibit 3 to your testimony in this case, excluding  
14 from that question Exhibits A through D?

15 A I don't think so.

16 Q Do you have an understanding of the relevance of these  
17 documents, if any, to the testimony that you expect to  
18 provide at a trial in this case?

19 A No, I don't.

20 MR. FELDMAN: That makes two of us.

21 A (Continuing) You asked for all of the documents which  
22 David had sent me and that's what you got.

23 Q In a letter that's dated August 24, 1988 that you wrote

1 to Mr. McCrea that appears as one of the documents in  
2 Exhibit 11 --

3 A What was the date of that letter? --

4 Q August 24, 1988.

5 Q It may be in a package that begins with a November 7,  
6 1988 letter.

7 A Oh, okay.

8 MR. FELDMAN: Let's go off the record.

9 (A discussion was held off the record.)

10 Q Doctor, you've located the August 24, 1988 letter from  
11 you to Mr. McCrea; is that right?

12 A Yes.

13 Q And that's part of Exhibit 11 that we previously  
14 identified. Towards the bottom you indicate that you  
15 have tapped the grapevine to see if the record books  
16 are located and if anyone has tried to find them  
17 recently.

18 Who did you ask whether anyone had tried to find  
19 them recently?

20 A Oh, we already discussed that. I called Dick Usury,  
21 U-s-u-r-y, at the Westinghouse Oceanic Division at the  
22 Bay Bridge site in Annapolis.

23 Q I take it he's the one you asked if anyone had tried to

1 find the books recently?

2 A Yes.

3 Q And why did you ask him whether anyone had tried to  
4 find those books recently?

5 A I was curious if anyone had. Well, I was curious for  
6 two reasons. No. 1, I wanted to know if he knew where  
7 they were. And No. 2, I was curious if -- I had  
8 mentioned the record books to Mr. Ordway, and I was  
9 curious if he had followed up to try to find them.

10 Q Why did you want to know that?

11 A Well, basically I guess deep down I feel like they're  
12 mine and I'd like to have them back someday. And if  
13 they are found and exist, then there is a chance that I  
14 might be able to somehow some way talk somebody into  
15 giving them to me or copies of them. Because I'm a  
16 research scientist and I have seven years of my  
17 research notes missing from my files.

18 Q In the second paragraph of that same letter of August  
19 24, 1988 you refer to a fee of \$500 a day. Is the fee  
20 that you are charging in this case \$500 or \$600 a day?

21 A Well, I don't know the answer to that. I would have to  
22 go back to the original letter that I wrote to David as  
23 to what it was, which should be in here somewhere. The

1 answer to your question right now is I had in the back  
2 of my mind it was \$75 an hour times eight hours,  
3 whatever that works out to be.

4 Oh, it says here in the letter on 5-16-88. This  
5 is where I laid out the costs. If I come to  
6 Bloomington, we should think of actual hours work  
7 exclusive of travel time up to a maximum of \$600 per  
8 day. And I apparently then misquoted myself in the  
9 later letter.

10 Q Okay. Now, going to Exhibit 10 which begins with a  
11 November 6, 1988 letter from you to Mr. McCrea, going  
12 to the second page of that letter where you are  
13 referring to the deposition of Jason Morrow which is  
14 part of Exhibit 12, did you conclude from reading the  
15 deposition of Jason Morrow that people had been injured  
16 at the Westinghouse plant as a result of exposure to  
17 PCBs?

18 A I don't know if I came to that conclusion from reading  
19 Mr. Morrow's deposition or not. I have come to that  
20 conclusion.

21 Q Was there anything in Mr. Morrow's deposition that you  
22 relied on in reaching that conclusion?

23 MR. FELDMAN: Let's go off the record.

1 (A discussion was held off the record.)

2 MR. FELDMAN: Would you read back the  
3 question.

4 (The Reporter complied with Counsel's request and  
5 read as directed.)

6 THE WITNESS: Could you read me the  
7 question previous to that one.

8 (The Reporter complied with the witness's request  
9 and read as directed.)

10 A Okay. Now, you were asking about the statement I made  
11 in a letter to David. I would say some of what Mr.  
12 Morrow says there goes along with a general feeling I  
13 have that individuals who worked at the plant were  
14 harmed by the PCBs and other vapors they were  
15 breathing.

16 Q Okay. You refer to that as a general feeling. That's  
17 not an area in which you profess to have any expertise?

18 A I think you asked me that question before. The answer  
19 is that is an area that I don't profess expertise.

20 Q Is it the case, then, that your opinions on possible  
21 connection between PCB exposure and human injuries is  
22 not something that you would expect individuals to rely  
23 on?

1 A I don't know how to answer your question. What  
2 individuals?

3 Q Well, individuals, for example, employed at  
4 Westinghouse who may be able to control PCB exposure.

5 A I really don't know.

6 Q In your experience in the scientific community is it  
7 common for people to rely on nonexpert testimony or  
8 nonexpert opinions in areas relating to medical  
9 causation?

10 A Sometimes. I mean if I walked into the shop and the  
11 vapors were strong and I said that you should do  
12 something about this, those vapors are harmful. my  
13 guess is they would probably listen. Now, whether they  
14 would do something, I don't know. It depends. I make  
15 those judgments in my laboratory all the time.

16 Q What judgments do you make in the laboratory?

17 A When working in the laboratory if I can smell solvent  
18 vapors I take steps to remove them because solvent  
19 vapors are harmful to you.

20 MR. FELDMAN: Let's take a quick break.

21 (Whereupon at 12:30 o'clock p.m. the deposition  
22 was recessed for lunch to be resumed at 1:18 o'clock  
23 p.m. at this same place).

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DIRECT EXAMINATION (Resumed),

QUESTIONS BY MR. FELDMAN:

Q    On page 6 of your preliminary report for Bloomington which has been marked as Exhibit 24 in the second full paragraph about the middle of the page you are, as I understand it, trying to explain the sample that you marked as B23, BL23; is that right?

A    Yes.

Q    Does the dotted line that leads from the dump to BL23 in figure 2 depict a gully of some kind?

A    I don't know the answer to that question. It's not the same kind of a line. It's a dash and a dot. The gullies are shown as dots.

Q    Gullies are shown as dashes, aren't they?

A    I mean as dashes, yes. I don't know the answer to that question. Unless that's supposed to indicate a little road. There is kind of a road there that goes into the dump at that point and crosses the highway.

Q    I'm trying to understand your statement there. You seem to be trying to find a means by which the .72 parts per million could have gotten from the dump to



1 where you found it?

2 A Yes, I am.

3 Q And I take it that that was an issue because there was  
4 no readily visible stream that would take it to that  
5 point; is that right?

6 A BL23 was a sample taken in a field that was being  
7 farmed. If I remember correctly, I walked down that  
8 road and I just kind of dipped through the barbed wire  
9 fence and went out into the field. And so one would  
10 expect that to be an indication of aerial fallout.

11 Now, at that time I was unaware of how much  
12 burning of capacitors was taking place in the landfill.  
13 Today as I sit here that's readily displayed. That was  
14 certainly aerial fallout of PCBs carried in the smoke  
15 from the landfill.

16 Q And how can you determine that?

17 A Well, I have heard a number of descriptions of the type  
18 of burning that took place at the landfill like daily  
19 capacitors were split open and burned and, well, that  
20 it wasn't hot enough to incinerate PCBs, only burn  
21 them. And so I would suggest that .72 is a result of  
22 the surface soil being contaminated by the PCBs falling  
23 out of the smoke from the landfill.

1 Q Are you reaching that conclusion as you sit here today?

2 A Yes. Yes. At that time, you see, I was not aware of  
3 how much burning took place. Nobody told me.

4 Q You do, though, indicate on page 6 that there had been  
5 some burning from that landfill; isn't that right?

6 A I think I was told there was some burning, that he had  
7 been cited several times about burning. I have since  
8 learned through the Conards and through others who live  
9 in that area and could observe it that the burning was  
10 a continuous process.

11 Q You recall as you sit here today that in 1971 and '72  
12 you did not understand that the burning was a  
13 continuous process?

14 A No, I wasn't told that.

15 Q Have you done any research on the levels one is likely  
16 to find in surrounding soil in an area that's had  
17 continuous burning as opposed to intermittent burning?

18 A No.

19 Q Have you reviewed any studies that discuss that  
20 question?

21 A I'm not aware that there have been any.

22 Q Can you think of any other explanations for why there  
23 might be a level of .72 across from the landfill at

1 B23?

2 A Well, I give one in the report. I say in the report  
3 one can imagine a number of explanations, a good  
4 possibility being that at one time the landfill  
5 operator sold waste Inerteen to the farmer down the  
6 road and carry-over contaminated the field next to the  
7 road.

8 Q And you've decided today that that was not the event  
9 that caused the PCB level of .72 parts per million at  
10 B23; is that right?

11 A I'm suggesting another possibility as the aerial  
12 fallout.

13 Q Well, a minute ago I asked you if you concluded that's  
14 what caused it, and you told me that you had concluded  
15 that. Is your testimony that these are two  
16 possibilities that you can't distinguish between as to  
17 their relative likelihood or have you concluded that  
18 one is the true one and one isn't?

19 A Perhaps I was a little careless with my terminology  
20 here. With the information that I have at hand today I  
21 would be more likely to suppose that it got there by  
22 aerial fallout. Now, I have no way of proving either  
23 one of those suppositions. But based upon the other

1 data I have seen on PCBs in soil in less contaminated  
2 areas, that one is too high.

3 Q Do you think there are any other possible sources for  
4 that sample, for that deposit, of PCBs in that field  
5 other than the two you've mentioned here; namely,  
6 aerial fallout and a farmer who took some Inerteen from  
7 the landfill?

8 A Well, there probably are. It's possible that the  
9 farmer could have used a pesticide preparation that had  
10 PCBs in it as an extender and applied it to the field.  
11 Possible. Less likely, I think, but possible.

12 Q Any others?

13 A None spring to my mind.

14 Q Are you aware of any other industries that sent  
15 materials to Neal's Landfill other than Westinghouse?

16 A I'm not, no.

17 Q If I were to tell you that Neal took materials from  
18 other companies than Westinghouse who manufactured such  
19 things as TV sets and refrigerators and other  
20 electrical devices, would that information lead you to  
21 conclude that there are other possibilities for the  
22 source of PCBs to either the landfill or this location.

23 B23?

1 MR. McCREA: Jan, I'm going to object to  
2 your question. If you ask for information other than  
3 what you are telling Dr. Munson about TVs and  
4 refrigerators, fine. But there is no evidence in the  
5 record to support your question.

6 MR. FELDMAN: In what record?

7 MR. McCREA: Any record. And if you have  
8 evidence that you want to then incorporate into the  
9 question, fine. But to deal with something that is  
10 purely speculation as part of your question is  
11 inappropriate.

12 MR. FELDMAN: If you are suggesting that  
13 I'm making this question up out of thin air, you're  
14 clearly wrong, and you know that. And I am entitled to  
15 ask him a reasonable hypothetical question without  
16 having to produce one drop of evidence in this  
17 deposition as to the basis for the question.

18 MR. McCREA: Would you like him to exclude  
19 himself from the room while we discuss it?

20 Do you have any evidence that there were PCBs from  
21 any other source?

22 MR. FELDMAN: Well, David, I think I have  
23 the right to ask the hypothetical question.

1 MR. McCREA: The answer to your question  
2 is no, you have no basis, and you know it.

3 MR. FELDMAN: Are you going to instruct  
4 him not to answer?

5 MR. McCREA: No.

6 MR. FELDMAN: Then let's get on with it.

7 MR. McCREA: Let's stick with the  
8 information that you as attorney of record know and  
9 that Joe Carney as attorney of record in Westinghouse  
10 matters since 1956 knows and please incorporate that  
11 information into your question. If you have a basis  
12 for the question, fine. If you have no basis, you're  
13 wasting everybody's time.

14 MR. FELDMAN: You made your objection.

15 You can answer my question if you remember it.

16 A I think I do. I don't think it alters my statement  
17 that my most likely supposition is that the PCBs out  
18 there in the field got there from the landfill.

19 Q Are there other sources of PCBs other than pesticide  
20 extenders that could have accounted for the presence of  
21 B23 having nothing to do with Neal's Landfill?

22 A Sure. Maybe a student from the local high school was  
23 using an oil emersion microscope and he chose that

1 location to dispose of the microscope. Sure, I can  
2 think of a thousand of them, but what's the point.

3 Q Is that the only other one that you could think of that  
4 could plausibly account for the presence of positive  
5 PCBs of .72 parts per million in a farmer's field.

6 A I'm sorry. You didn't say plausibly. I don't consider  
7 that last response plausible. But I was making a  
8 point.

9 Q I assumed we were only dealing with plausible answers.

10 A Well, okay. The list of uses of PCBs is long. I think  
11 we read through that at one point, either you did or I  
12 did. Could be in brake fluids. It goes on and on.  
13 Now, since we're a hundred yards from a landfill that  
14 has a reputation for receiving liquid PCBs and burning  
15 material creating a black, dense smoke that blew across  
16 that field, I thought that was the most likely  
17 response.

18 Q Why do you think that's more likely than the pesticide  
19 extender?

20 A Because I don't think that was a very wide use for  
21 PCBs.

22 Q Did you make any investigation of the use of pesticides  
23 that contain PCBs as extenders in the Bloomington area

1 before you reached the conclusion in Exhibit 24 that  
2 had to have come from Inerteen at the landfill?

3 A No, I didn't. But I didn't find high levels of PCBs in  
4 every sample I took that came from farm fields or  
5 adjacent to farm fields, which would lead me to  
6 conclude that the farmers in the area were not  
7 routinely spraying with PCBs. That one particular  
8 farmer could have, sure. Okay.

9 Q But despite that possibility you still believe B23 is  
10 more likely to have come from aerial fallout than from  
11 pesticide extenders; is that right?

12 A I would say more likely, yes.

13 Q Or from transmission fluid; is that correct?

14 MR. McCREA: That was not his testimony.  
15 again, Jan.

16 MR. FELDMAN: I'm asking the question.

17 MR. McCREA: You're dealing with  
18 possibilities. You don't deal with possibilities in  
19 law. You deal with basis information.

20 MR. FELDMAN: That's what I'm asking him.

21 MR. McCREA: Does he have any basis  
22 information that there were any other PCBs dumped at  
23 this site other than the PCBs which he was told were



1 dumped there by Westinghouse; is that your question?

2 MR. FELDMAN: No, that wasn't my question.

3 MR. McCREA: Let's talk about basis  
4 information, not possibilities. Anything is possible,  
5 Jan.

6 MR. FELDMAN: David, I'd like him to  
7 testify. I appreciate your input, but I would prefer  
8 to have Dr. Munson testify so we can get out of here at  
9 4:15.

10 MR. McCREA: If you will deal with the  
11 questions that are in the record, that's fine.

12 MR. FELDMAN: You were not here when he  
13 indicated other applications for --

14 MR. McCREA: Do you have information that  
15 there was brake fluid dumped at this landfill?

16 Do you?

17 MR. FELDMAN: I'm not going to argue with  
18 you. It's a legitimate question, and I'd like to ask  
19 it to the witness.

20 MR. McCREA: About what's possible.

21 Q My question was: You still believe that it is more  
22 likely that B23 came from aerial fallout than from a  
23 spill of transmission fluid?

1 A I would think so. The sample was taken out in the  
2 farmer's field, not on the road. However, a tractor  
3 can have a leaky transmission. Anything is possible.

4 Q Doctor, look at figure 3 in Exhibit 24. This is the  
5 same landfill, is it not, as the one that's depicted on  
6 figure 2?

7 A I think so.

8 Q Both referred to as landfill No. 1?

9 A Yes, I believe so.

10 Q If .72 at B23 is from aerial fallout, why is it that  
11 the levels reflecting aerial fallout in figure 3 are  
12 all in the hundredths of parts per million?

13 A It's difficult from this map to see what the scale is.  
14 I'm guessing that those samples are at some further  
15 distance away.

16 Q You can't tell that from the report, can you?

17 A Basically it's showing roads that are not on figure 2.  
18 See Highway 48 and then those other lines represent. I  
19 believe, roads. I think we're looking at a greatly  
20 expanded scale here.

21 Q Well, Highway 48 is the road that goes just beneath the  
22 landfill both on figure 2 and on figure 1; isn't that  
23 correct?

1 A Yes, I think so.

2 Q Can you tell given those relative distances, namely,  
3 from the road to the dump, where B45 would be on the  
4 map of figure 2?

5 A I can't really, no.

6 Q Would this be far away from B23?

7 A I would think so, yes. But I can't tell for sure.

8 Q As I look at those at the distance from B45 to the road  
9 and B23 to the road, it doesn't seem like there's much  
10 difference there at all. Would you agree with that?

11 A I don't think we can tell from the map. I don't  
12 indicate a scale on them. Figure 2 doesn't show the  
13 road that loops up over the top there. I can't really  
14 tell.

15 Q All right. Let me make sure I'm reading this right.  
16 The distance from Highway 48 to the dump in figure 2  
17 would be represented by the distance from Highway 48 to  
18 the dump in figure 3, wouldn't it?

19 A Well, only if it was drawn to scale. These may not be  
20 drawn to scale at all.

21 Q You mean the distance from Highway 48 to the dump in  
22 figure 3 might represent a mile and in figure 2 it  
23 would be an entirely different distance?

1 A Well, obviously the distance between the dump and the  
2 highway is what it is. It's just on my drawing here I  
3 may not have been careful enough to put -- On the scale  
4 of 3, for instance, it may be that the dump should be  
5 shown practically touching the road. I don't remember  
6 the intent of what I was doing here when I drew it. I  
7 think I was showing a broader scale, the samples at  
8 some greater distance, but I can't say that for sure.

9 But BL23, the samples on figure 2, the numbers go  
10 up to 27. We're looking at numbers here up in the high  
11 40s. So, some 20 samples have been taken since these  
12 were taken. So, I really don't know the answer to that  
13 question of how close BL23 is to BL45.

14 Q You say you don't know the relative scale of those  
15 distances as you sit here today. Is it fair to say  
16 there is nothing in your report that would indicate  
17 that the scale of figure 3 and figure 2 were meant to  
18 be entirely different?

19 A I'd say you would draw that conclusion from the fact  
20 there is a road that isn't shown on this one.

21 Q Referring to figure 2?

22 A Yes.

23 Q Is it your understanding that the road that intersects

1 Highway 48 and going toward the top of both figure 2  
2 and figure 3 pretty much follows Richland Creek?

3 A I don't know the answer to that question. My problem  
4 is I haven't seen any of the backup material used to  
5 generate this report for 17 years. What we have is  
6 what we have in front of us and what little bit I can  
7 remember. I can't remember.

8 Q Well, let me ask you this question: Given the fact  
9 that there is no indication in the report that the  
10 scale of figure 2 and the scale of figure 3 are  
11 drastically different, would you concede that someone  
12 reading this report would wonder why if aerial fallout  
13 is contributing to PCB levels around the dump BL45  
14 would be so much lower than BL23?

15 A If you knew they were close to each other you would  
16 wonder that, yes.

17 Q I think you've told us that from the drawings  
18 themselves they appear to be fairly close to one  
19 another; isn't that correct?

20 A I just don't know the answer to that question.

21 Q I don't mean their actual location. I mean from the  
22 way they appear in these two figures BL23 and BL45  
23 appear to be pretty close to one another; wouldn't you

1 agree with that?

2 A No, I won't agree because I don't know the scale on  
3 these maps. And I don't see any indication in the  
4 report as to whether this was a close in sampling and  
5 figure 3 is a further out sampling and I just haven't  
6 indicated the dump on the right scale or whether for  
7 some reason I chose not to indicate the road.

8 I didn't number the road. I don't know the answer  
9 to the question, how close those samples are to one  
10 another.

11 Q What road didn't you number?

12 A The highway that loops up that connects with 48 that's  
13 shown on figure 3.

14 Q That loops up to BL46?

15 A Yes.

16 Q I'm referring to the road that goes underneath the  
17 dump, Highway 48.

18 A Yes, I know.

19 Q You agree that's labeled on both drawings, right?

20 A Yes.

21 Q If it turned out that BL45 and BL23 were in fact a few  
22 feet from one another, would that change your opinion  
23 that the most plausible explanation for those samples

1 is aerial fallout?

2 A Not necessarily. That sample at .07 is still a bit  
3 high. 47 and 48 are around .01. And I still have BL23  
4 to deal with. The aerial fallout is not necessarily  
5 going to create a uniform blanket of PCBs on the  
6 surface soils. In the report I notice that the 40  
7 series is BL -- BL23 is referred to as being earlier or  
8 at least the other ones are referred to as being later  
9 soil samples.

10 Q Where are you referring to?

11 A On page 6 the middle paragraph there. It says one can  
12 imagine a number of explanations for B23 being more  
13 than 10 times higher than the later soil samples. And  
14 another possibility, only it's not clear from this  
15 report, is that these samples were taken at a later  
16 point in time. They could be next to each other.  
17 Maybe the farmer disked the field in the meantime and  
18 turned up fresh soil. I don't know.

19 Without the backup information to tell me exactly  
20 what these samples are and when they were taken and  
21 exactly where, I can't really answer that question.  
22 But this sentence seems to indicate that they were not  
23 taken at the same time, that the samples shown in

1 figure 3 were taken at a later date than was the high  
2 sample, B23.

3 Q All right. Wouldn't you agree that not knowing  
4 anything about the backup data that lead to all these  
5 samples, not having your daily record, not having taken  
6 the samples, a reader looking at figure 2 and figure 3  
7 would question your conclusion that the samples found  
8 around that dump are indication of aerial fallout?

9 A What would be your basis for questioning it?

10 Q Well, I'm asking you if you think that's a reasonable  
11 question that a reader of this report would come to  
12 based on figure 2 and figure 3.

13 A Well, but sorry. You have to tell me what the reader  
14 has assumed. Has the reader assumed BL23 and BL45 are  
15 directly adjacent to each other?

16 Is that what's disturbing the reader?

17 If you want to ask me what's in the reader's mind,  
18 you have to tell me what's in his mind.

19 Q All right. If a reader concluded that BL23 and BL45  
20 were close to one another based upon looking at figures  
21 2 and 3, would he reasonably call in and question your  
22 conclusion that any of those samples resulted from  
23 aerial fallout?



- 1 A He might wonder why the levels are not nearly the same.  
2 If he asked me that question, I would suggest that if  
3 in fact those samples are adjacent to each other, they  
4 are separated in time as indicated by the report. 45  
5 is referred to as a later sample than 23. That opens  
6 up a number of possible explanations for a difference,  
7 the most likely one being that if indeed it was aerial  
8 fallout perhaps the farmer came in and turned the soil  
9 over prior to my sampling of BL45. I don't know.
- 10 Q Looking at page 8 of your report at the top of the page  
11 did you conclude from the work that you did in  
12 Bloomington that the problems the farmer was having  
13 referred to at the top of page 8 and the bottom of page  
14 7 resulted from exposure to PCBs?
- 15 A Did I conclude it?
- 16 Q Yes.
- 17 A Yes, that was my conclusion.
- 18 Q Looking at the next paragraph, the leaching from this  
19 landfill could easily be getting into the human food  
20 chain. That's a quote from that middle paragraph. Did  
21 you conclude at that time that in fact that was  
22 happening?
- 23 A I don't remember whether I specifically came to that

1 conclusion. Although, I do state there that it's  
2 highly likely. Well, actually I state could easily be  
3 getting into the human food chain. Depends upon  
4 whether they were eating the pigs or someone was eating  
5 the pigs.

6 Q Are you aware that cattle from the Conards' farm was  
7 tested for PCBs in the early 1980s?

8 A I don't remember any data like that.

9 Q Mr. McCrea never told you that cattle from the Conards'  
10 farm were tested for PCBs?

11 A I don't remember if he did or not.

12 Q Is it your feeling that that's the first time you have  
13 heard that, my telling you today?

14 A Well, if I've heard it before, I don't remember hearing  
15 it.

16 Q If I were to tell you that the Conards' cattle were  
17 tested for PCBs in the early 1980s and the levels came  
18 up negative, would that alter your conclusion in this  
19 middle paragraph on page 8 about the possible  
20 contamination of livestock around that landfill?

21 A What did they test?

22 Q Fat.

23 A And to what level did they test?

1 Q Well, what if I were just to tell you that the levels  
2 came up negative, would that alter your conclusion in  
3 any respect?

4 MR. McCREA: Your question does not  
5 incorporate where those cattle consumed water, either?

6 MR. FELDMAN: No. Just from the Conards'  
7 farm.

8 A Well, I'd like to know the answer to how low the levels  
9 were they tested. If the cattle had been grazing on  
10 the pasture on Conards' farm, I'd be surprised if the  
11 fat came up negative.

12 Q When you say you'd be surprised if the results came up  
13 negative, if in fact the results did come up negative,  
14 would that alter your conclusion at all as to the  
15 possibility that PCBs from the landfill might be  
16 regularly getting into cattle that graze around there?

17 A All I can say is I find that surprising. Now, whether  
18 it would alter my conclusion, I'd like to see some more  
19 data. I'd like to know about the cattle, where they  
20 were, how long they were there, what was tested. But I  
21 would find that surprising, yes.

22 Q At the bottom of page 8 referring to the paragraphs  
23 under the heading called sanitary landfill No. 2, have

1       you come to identify that landfill as the Neal's Dump  
2       in Spencer County or does that term not mean anything  
3       to you?

4   A   Yes, I've heard that term. I think that's right. But  
5       I'm not a hundred percent sure of that.

6               MR. FELDMAN: David, will you concede  
7       that's what sanitary landfill No. 2 is?

8               MR. McCREA: Yes, in Owen County.

9   Q   Would you read the first paragraph under sanitary  
10       landfill No. 2 on page number 8 just to your yourself.

11   A   (Witness complied). Okay.

12   Q   Was it your understanding in 1972 when you drafted this  
13       report that in 1968 Westinghouse instructed its waste  
14       hauler to take all Inerteen waste not to Neal's  
15       Landfill, not to landfill No. 1, but to the Neal's Dump  
16       in Owen County?

17               MR. McCREA: Are you asking him if based  
18       upon reading this that's his opinion?

19               MR. FELDMAN: I asked him to read this so  
20       that he could refresh his recollection. What I'm  
21       asking now is for his understanding in 1972.

22   A   Yes. My understanding and I'm basing that upon what I  
23       have written here and what I take this to mean that I

1 wrote here is that sometime in the period 1968 to 1972  
2 a new landfill was started and that I was told only  
3 solid waste Inerteen was put in that landfill.

4 Q What was your understanding at that time as to where  
5 liquid waste Inerteen was going?

6 MR. McCREA: Can you define solid waste  
7 for us?

8 MR. FELDMAN: Well, whatever his  
9 definition was in the report.

10 MR. McCREA: Well --

11 MR. FELDMAN: It's his term.

12 MR. McCREA: I would object to the  
13 question unless solid waste is defined and liquid  
14 waste. If you don't want to define it, fine.

15 MR. FELDMAN: Let's first ask him.

16 Q You've referred to solid waste. I take it that is  
17 meant to be distinguished from liquid waste, right?

18 A Yes.

19 Q What was your understanding of where liquid waste  
20 Inerteen was being taken once the solid waste was taken  
21 to the Neal's Dump?

22 A I believe I was told other than the liquid that was  
23 going to the sewer -- There was surely some there as

1 part of the manufacturing process -- that the liquid  
2 was being sent to Monsanto. But I have no personal  
3 knowledge of that. I know just what I was told.

4 Q Okay. You have no personal knowledge of it. You're  
5 basing it on what people at the plant told you as to  
6 where they were depositing of those materials at the  
7 time; is that right?

8 A The people that I was dealing with.

9 Q Which would have been Lew Shoaff primarily; is that  
10 right?

11 A Primarily Lew Shoaff.

12 Q On page 10 the paragraph that begins with the words "at  
13 first analysis" you refer to a statement by the  
14 Monsanto Chemical Company that solid waste can be  
15 contained in a sanitary landfill.

16 Do you remember what that refers to?

17 Do you see where I'm looking?

18 A I see what you're saying, yes.

19 MR. McCREA: Again, I would like for you  
20 to define solid waste, if you have a definition. If  
21 you do not, fine.

22 MR. FELDMAN: I'm merely asking him to  
23 explain the sentence here. I'm not coming up with a

1 term and asking questions about it. I'm discussing his  
2 terminology.

3 MR. McCREA: Fine. My objection is we do  
4 not have a working definition of solid waste. If a  
5 capacitor filled with liquid is solid waste as opposed  
6 to metals with contamination on them, I think we have  
7 two different working definitions.

8 I do not know what you mean when you address the  
9 issue of solid waste.

10 MR. FELDMAN: For the purpose of my  
11 question, I'm referring to whatever was meant by the  
12 term as used on page 10 in that middle paragraph.

13 MR. McCREA: Fine.

14 A (Continuing) If I understand your question, you want  
15 to know what I meant by as has been asserted by the  
16 Monsanto Chemical Company?

17 Q That's right.

18 A Okay. My recollection is that at that time Monsanto  
19 maintained that PCB solid waste could be adequately  
20 contained in a landfill covered with soil because it  
21 did not, PCBs did not, migrate through the soil,  
22 according to their claim.

23 Q Do you remember where Monsanto made that claim?

1 A No, I don't remember.

2 Q Has your review of any of the materials that Mr. McCrea  
3 provided to you refreshed your recollection on that  
4 question?

5 A I don't remember. There is a bit of information from  
6 Monsanto in these pages somewhere. And I believe at  
7 some point Monsanto recommended not putting stuff in  
8 the landfill. But I'm not sure when that change was  
9 made.

10 Q Going down that same paragraph there's a reference to  
11 capacitor cans from the plant which had not been  
12 emptied. What was your understanding at that time  
13 about the plant's practice of emptying capacitor cans  
14 before sending them to landfills?

15 A Well, my understanding was that the cans would be  
16 opened and the Inerteen poured out and that the can  
17 that was left, then, was then defined as being solid  
18 waste to be taken to a landfill.

19 Q Now, when you say that the capacitor cans had not been  
20 emptied, then you're saying there was some indication  
21 that not all the capacitor cans that went to Neal's  
22 Dump had gone through the process that you just  
23 described?



1 A Yes.

2 Q Do you know where you got that information?

3 A I'm assuming I got it from Lew Shoaff.

4 Q Do you remember what he said to you in that regard?

5 A No, I don't.

6 Q Do you remember what he said to you about the quantity  
7 of capacitor cans which had been emptied as opposed to  
8 the ones that had not been emptied?

9 A I don't remember anything about that.

10 Q At the time that you took the samples at Neal's Dump  
11 was Westinghouse still disposing of materials to that  
12 dump?

13 A I don't know the answer to that question.

14 Q Do you know the circumstances of the switch from  
15 sanitary landfill No. 2 to sanitary landfill No. 3?

16 MR. McCREA: Are we talking about Neal's  
17 Dump in Owen County to the Anderson Road landfill?

18 MR. FELDMAN: Right.

19 Q Well, let's clear that up. There's a reference to  
20 sanitary landfill No. 3 on pages 10 to 11. Is it your  
21 understanding that's the Anderson Road landfill?

22 A I really don't know.

23 Q Well, whatever sanitary landfill No. 3 is, did anyone

1 explain to you what the circumstances were of the shift  
2 from Westinghouse's materials being taken to sanitary  
3 landfill No. 2 and then to landfill No. 3?

4 A The best of my recollection is that they were not  
5 satisfied with how things were working at landfill No.  
6 2 and wanted to go to a new area.

7 Q Do you remember how that dissatisfaction came about?

8 A Only what I have reported in the report here. I  
9 mention that there were some complaints. Apparently  
10 the landfill operator was not doing what he was  
11 supposed to be doing. The last sentence before you get  
12 to section 2.3, actually the next to the last, refers  
13 to a game warden complaining about oily materials  
14 getting into the river.

15 Q By the river I take it that means the White River or do  
16 you know?

17 A Yes, I think it was the White River.

18 Q If oily materials were getting into the White River, I  
19 gather, then, you would be able to see the oil on the  
20 river; is that right?

21 A It depends. It might be a slick on the surface or more  
22 likely oily deposits going down the bank.

23 Q If it were a slick on the surface, would that be PCBs?

1 A Probably not. PCBs are heavier than water.

2 Q I'm not sure what you mean by oils on the bank. Can  
3 you explain that?

4 A Well, you could see if material were moving from the  
5 landfill over down into the river, one would see  
6 essentially oily material on the surface of the soil.

7 Q You mean like a big blob of material progressing along  
8 the surface of the land and spilling into the river; is  
9 that what you are referring to?

10 A Yes.

11 Q Is it likely that the levels that you found in the  
12 various locations around Neal's Dump would be what you  
13 have reported them if that phenomenon had occurred and  
14 the oily material was PCBs?

15 A If the oily material were Inerteen or were pure  
16 Inerteen, of course not. The levels would be much,  
17 much higher.

18 Q From that analysis can you conclude that the oily  
19 material that the game warden referred to would not be  
20 Inerteen?

21 A It may not be pure Inerteen. It's really hard to say.

22 Q How could the levels in the White River be at the .49  
23 parts per million, .12 parts per million level and in

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1 the gully that leads from the landfill in the .34 parts  
2 per million level if the game warden is reporting  
3 visible PCBs in the river?

4 A Well, he most likely is not seeing pure PCB material.  
5 It's hard to tell. Depends upon what they put in the  
6 landfill.

7 Q Well, if the material that he was seeing was not PCB  
8 material, then the fact that the game warden reported  
9 it wouldn't really reflect badly on the disposal of  
10 Inerteen into that landfill, would it?

11 A No. It would be reflecting upon the operation of the  
12 landfill as a whole.

13 Q I take it like the other reports of events preceding  
14 your sampling that appear in this report, you don't  
15 have any other information about the game warden other  
16 than what appears here?

17 A Unless there is more detail written in one of my books.  
18 Basically --

19 Q What you see is what you get?

20 A What you see is what you get at this point.

21 Q Referring back to the sampling you did at the Neal's  
22 Landfill referred to in figures 2 and 3 and look, if  
23 you will, at figure 2, BL26 is not on the Conards'

1 farm, is it?

2 A I don't know the answer to that question.

3 Q You've never tried to ascertain the geography of the  
4 Conards' farm and match it up with figures 2 and 3?

5 A No.

6 Q There appears to be some creek or river or stream or  
7 something leading out the top of the dump or near the  
8 dump. Do you know whether that dash line refers to  
9 Conard's Branch?

10 A I really don't. That was drawn essentially from a  
11 topographical map. Not actually -- I never set foot on  
12 the Conards' farm at that time.

13 Q How do you know that?

14 A I beg your pardon.

15 Q How do you know that?

16 A How do I know what?

17 Q That you never set foot on the Conards' farm?

18 A I'm sorry. If BL26 is on the Conards' farm, I did.

19 Q But from figure 2 I take it that you understood that  
20 there was a stream leading out the other side of the  
21 landfill from Highway 48 opposite 48?

22 A I had a topographical map that was showing the lay of  
23 the land, and I sketched this sketch using the

1 topographical map. I did not in fact walk down the  
2 other side of the land -- In fact, I didn't set foot in  
3 the dump, in the landfill. So, I never ascertained as  
4 to whether there was a creek there or not.

5 Q How did you get the BL24 if you didn't go into the  
6 landfill?

7 A Walked through the fence. BL24 I don't think is in the  
8 landfill.

9 Q Or at least that's your understanding; is that right?

10 A Well, I don't think it is. We did our sampling by  
11 walking from the roadway. Nobody appeared to be  
12 looking. We walked over and took a sample.

13 Q Now, looking at figure 3, the road that intersects  
14 Highway 48 and goes up to BL46, describe the area of  
15 BL46.

16 A I don't remember.

17 Q Is it near a road?

18 A I think so. I mean I believe that black line is a road  
19 that loops from Highway 48 goes north loops around and  
20 comes back to Highway 48.

21 Q But you don't know whether BL46 is on the Conards'  
22 farm, do you?

23 A No, I don't.

1 Q And you don't have any recollection of actually taking  
2 the sample at BL46?

3 A No, I don't.

4 Q Given the fact that these maps may not be drawn to  
5 scale, it would be impossible to reconstruct the exact  
6 location of BL46 from this report, wouldn't it?

7 A Probably.

8 Q Doctor, on page 10 again -- I'm sorry to keep jumping  
9 around -- just before the section 2.3, the last  
10 sentence says: Obviously the data do not accurately  
11 reflect upon the disposal of Inerteen contaminated  
12 solid waste in a sanitary landfill.

13 What was inaccurate about the way the data  
14 reflected upon the disposal?

15 A Because the landfill had apparently received liquid in  
16 addition to solid waste.

17 Q I'm still confused. Are you saying that the data would  
18 indicate very low level of PCBs; whereas, the landfill  
19 accepted liquid Inerteen which you would suggest would  
20 have higher migration?

21 A No. What I'm saying is we thought the landfill site  
22 would represent a site showing whether or not solid  
23 waste contaminated with PCBs put in a landfill would

1 fail to migrate. But as it turns out, this was not  
2 such a test because we found that the landfill operator  
3 had put liquid waste in the site.

4 So, in fact we had a landfill that had liquid and  
5 solid waste in it.

6 Q The end result of that was that you couldn't conclude  
7 that solid waste Inerteen could be contained in a  
8 sanitary landfill as stated by Monsanto Chemical based  
9 upon the data here?

10 A Yes. Yes. It was not a clear-cut case because an  
11 unknown amount of liquid had reached that landfill.

12 Q Is the only source of liquid that you were aware of to  
13 that landfill, liquid Inerteen, the amount of liquid  
14 Inerteen in the capacitor cans that would have been  
15 drained had all of them been drained out?

16 A All I know is what I was told. And that's that the  
17 operator was putting in capacitor cans that had not  
18 been emptied.

19 Q My question was: Was the only source of liquid  
20 Inerteen that you were aware of at that time the  
21 Inerteen in the capacitor cans that otherwise would  
22 have been drained out?

23 A Yes. I understand your question now. Yes, that was



1 understanding was that the intention had not been to  
2 put liquid into that landfill, but it was discovered  
3 some cans that had not been emptied had gotten into the  
4 landfill.

5 Q Now, going to the sampling you did around the plant,  
6 starting on page 11, have you reviewed any other  
7 sampling data taken later than your sampling data from  
8 the plant for PCBs?

9 A I don't think so.

10 Q Is the same true with respect to the levels that you  
11 reported in figure 6?

12 A I've seen a lot of stuff since I got involved here, but  
13 I don't recall comparing another set of data with this  
14 set of data. I don't recall having seen any.

15 Q In any case, it would be not material that you provided  
16 us if you had seen it: is that right?

17 A I think so. Well, I have given you everything that  
18 David gave to me.

19 Q I'll have you assert that one or two more times today  
20 and then we're done. On page 11 you refer to a fish  
21 sample at the junction of Stout Creek and Beanblossom  
22 Creek which showed 5 parts per million.

23 Was that in the whole fish or the edible portion.

1 if you remember?

2 A I think that was the whole fish.

3 Q When you say Inerteen formulation, what formulation are  
4 you referring to?

5 A That would be 1242.

6 Q Going down on page 15 you indicate that the samples  
7 from the White River indicate another source other than  
8 Westinghouse.

9 I take it that's figure 7 that you are referring  
10 to?

11 A Yes.

12 Q Can you explain how figure 7 indicates an alternate  
13 source or different source for the PCB materials in the  
14 White River other than the Westinghouse operations?

15 A I don't see the answer to that question. Well, I've  
16 looked at the information here, and I'm not quite sure  
17 how I came to that conclusion. I may have been putting  
18 a lot of faith in the relative values for PCB in these  
19 samples. If you notice, the samples close to the  
20 Westinghouse plant, referring to figure 7, BL22 is 23  
21 PPM. As you move downstream they get lower. Until you  
22 have the Beanblossom flowing toward the White River,  
23 you have the Beanblossom at .27, then in the White

1 River BL50 is .07, BL49 is .17, BL31 .21, essentially  
2 getting higher as they go downstream.

3 I may have been concluding that that didn't seem  
4 logical, that you would expect a deluding out effect if  
5 you went downstream if the source of all of the PCB in  
6 the White River was back here at the Westinghouse  
7 plant.

8 Q Did you do anything to determine other sources in the  
9 Bloomington or Spencer area for PCBs into any of these  
10 waterways?

11 A No.

12 Q Have you become aware of any other possible sources of  
13 PCBs into any of those waterways since doing the  
14 report?

15 A Well, I have been told about -- And I haven't picked  
16 out any of them on the map -- about various places  
17 around Bloomington that were contaminated with PCBs  
18 early on with people tearing down capacitors and that  
19 sort of thing. I don't know how any of those relate to  
20 any of this geographical area.

21 Q I take it all those locations that you were told about  
22 ultimately emanate from the Westinghouse plant in the  
23 sense that materials came from there to begin with?

1 A I think so.

2 Q And I take it it was Mr. McCrea that told you about  
3 those; is that right?

4 A Yes.

5 Q He didn't tell you about any source of PCBs to the  
6 waterways in this area other than Westinghouse related  
7 sources; is that right?

8 A I'm not sure. I've had a lot of information given to  
9 me. I do have some recollection of some other PCBs.  
10 but I can't remember what they are or where they were  
11 from.

12 Q Doctor, looking at the first full paragraph on page 15  
13 you say in the last sentence of that paragraph that  
14 it's not possible to determine the magnitude of the  
15 contribution from Westinghouse compared to the amount  
16 from the unknown without undertaking a detailed water  
17 monitoring program.

18 Would you agree that it's not possible to  
19 determine the amount of contribution from Westinghouse  
20 to the samples that you took around the landfills  
21 without undertaking some more detailed investigation?

22 THE WITNESS: I'm sorry. Could you read  
23 me the question again.

1 (The Reporter complied with the witness's request  
2 and read as directed.)

3 A That's what I thought you asked. I don't care how many  
4 samples I take around the landfill, I still can't make  
5 any statement about Westinghouse's contribution. I can  
6 make a statement maybe about movement of material from  
7 the landfill to the sample site, but I can't say  
8 anything about Westinghouse's contribution.

9 Is that what you were asking?

10 Q That's right. Thank you. Would you agree that if you  
11 were to take PCB measurements in most landfills that  
12 accept urban waste and industrial waste in the period  
13 that you sampled Neal's Landfill around Bloomington  
14 that you would find some level of PCBs in those  
15 landfills?

16 A Certainly.

17 Q Would you also agree that given that fact you would  
18 find some level of PCBs having migrated out of those  
19 landfills?

20 A Probably.

21 Q Just so I'm clear on something, in the report on page  
22 15 you list some fish samples you took which range from  
23 4.3 to 7.2 parts per million. You're not contending in

1 this report that those levels came from PCB discharged  
2 from the plant, from the Westinghouse plant, are you?

3 A No. These were bought from a commercial fisherman on  
4 the White River near the Worthington bridge.

5 Q And I understand your point to be that fish taken from  
6 that area would not be accumulating PCBs from the  
7 Westinghouse plant?

8 A Hard to say.

9 MR. McCREA: Read the report.

10 A (Continuing) Last sentence says --

11 Q I can read the report. But my question is: You didn't  
12 conclude from those fish samples and any other work you  
13 did in that area that the PCBs that you found in those  
14 fish had emanated from the Westinghouse plant?

15 A That's true. I did not make that conclusion. I did,  
16 however, verbally urge that since we knew these fish  
17 had PCB levels higher than the FDA limit for human  
18 consumption that it was our moral responsibility to  
19 report the data.

20 I felt bad about not saying something to somebody  
21 about those levels.

22 Q On page 6 of your report you indicate that there were  
23 some samples taken in June of '72. See that at the

1 bottom of the first paragraph?

2 A Yes.

3 Q And if I'm not mistaken, on Exhibit 22, which is your  
4 daily record books, there are references to some  
5 samples which were recorded in August of '72; is that  
6 right?

7 Looking at the first page of Exhibit 22.

8 A Yes.

9 Q And those samples would be Bloomington samples as part  
10 of this report, right?

11 A Yes. Oh, excuse me. I'm sorry. Those Bloomington  
12 samples say July after them.

13 Q Well, but they were analyzed in August?

14 A They were extracted, the EX8-3-82 --

15 Q 72?

16 A Yes, 72. Yes. These samples are all from a July  
17 sampling trip.

18 Q And they weren't analyzed until sometime in August of  
19 '82, right?

20 A '72.

21 Q I'm sorry. '72?

22 A Yes.

23 Q Does that indicate that the report would have been

1 drafted sometime after August of 1972?

2 A I think so. I just wanted to check. Some of those  
3 sample numbers did appear on a figure back here, did  
4 they not?

5 Q 54, I believe, did. See?

6 A Yes. Okay.

7 Q So, can you conclude from your review of Exhibit 22 and  
8 the report that Exhibit 24 would have had to have been  
9 drafted sometime after August of '72?

10 A Yes.

11 Q Does it refresh your recollection any more as to the  
12 exact month?

13 A It really doesn't. I was doing too many things at the  
14 time.

15 (Defendant's Deposition Exhibit 26 was marked for  
16 identification.)

17 Q Referring you to what we have just marked as your  
18 Exhibit 26 which is a June 5, 1972 letter from you to  
19 Mr. Shoaff, do you have a recollection of drafting this  
20 letter on or about June 5, '72?

21 A I knew there were some communications. I guess I don't  
22 remember this particular letter, no.

23 Q Does this refresh your recollection that some of the



1 samples that you took in the Bloomington area that  
2 appear in your report were done by Mr. Shoaff or  
3 someone at his direction?

4 A He took some samples for me.

5 Q Pursuant to the directions in this letter; is that  
6 right?

7 A Yes.

8 Q Looking at the second page of Exhibit 26, does this  
9 refresh your recollection that some of the locations  
10 for the samples were determined not by yourself but by  
11 Mr. Shoaff or somebody at his direction depending upon  
12 his assessment of drainage and slope and things like  
13 that?

14 A In the landfill sites for sure. In fact, he continued  
15 sending me samples for quite some while. And I don't  
16 remember how many boxes of sediment or soil samples he  
17 sent me.

18 Q I believe you indicated in your first deposition the  
19 soil samples were taken physically in a truck from  
20 Bloomington to Annapolis. Does your review of Exhibit  
21 26 refresh your recollection that some would have been  
22 sent by perhaps common carrier from Bloomington to  
23 Annapolis?

1 A I thought we said that, that Shoaff took later samples  
2 and sent them to me. The samples that were taken by  
3 myself and others with me when we visited out there we  
4 took home with us in a truck.

5 Q When you said that Mr. Shoaff took samples around the  
6 landfills, did he take any samples around Neal's  
7 Landfill?

8 A Not that I am aware of. I think we took all of those  
9 samples.

10 Q Are you certain of that as you sit here today?

11 A I remember taking those samples. I don't remember Lew  
12 Shoaff was with us when we sampled Neal's Landfill.

13 Q Did he do the sampling around Neal's Dump?

14 A I visited Neal's Dump once, I'm sure, but I'm not sure  
15 how many samples were taken there over which time  
16 period. So, I'm not sure whether I took them all or  
17 whether he took some of them. I believe I took one set  
18 myself.

19 (Defendant's Deposition Exhibit 27 was marked for  
20 identification.)

21 Q Doctor, you just reviewed Exhibit 22 a little bit more.  
22 Does it cast any doubt or add any information to your  
23 previous answers?

1 A No. I was just trying to figure out what date this  
2 series BL38 to BL44 was taken.

3 Q Referring you to a three-page document that we've just  
4 marked as your Exhibit 27 consisting of a June 29, 1972  
5 letter from you to John Britton and a July 29, 1972  
6 letter from you to John Britton, the first one being  
7 two pages and the second one being one page, did you  
8 send both of these letters to Mr. Britton at or about  
9 the dates that they bear?

10 A I presume so.

11 Q As I look at these two letters they are almost  
12 identical word for word, but there are some changes and  
13 one is a month later. Can you explain to me why there  
14 are two letters with almost the same information but  
15 slightly different wording?

16 MR. McCREA: Could we go off the record?

17 (A discussion was held off the record.)

18 A I don't have a clue why the June letter has got the  
19 data.

20 Q Well, I won't guarantee that the July letter didn't  
21 have the data.

22 A The June letter appears to make a stronger statement  
23 about the fact that PCBs are not leaching from the

1 landfill.

2 Q Is it possible that the July letter is the one that was  
3 sent and the June one was a draft that you never sent?

4 A I really don't have a clue.

5 Q Did you at some point come to learn that Mr. Brittain  
6 was not the general manager as indicated in the June  
7 letter?

8 A Yes. I carried in my memory for years that John  
9 Brittain was the general manager. Somehow I got that  
10 in my computer wrong. It was only recently it was  
11 pointed out to me.

12 Q Does the mistake that you have made in Mr. Brittain's  
13 title change any of the testimony that you gave in your  
14 earlier depositions about the lunch that you had with  
15 him?

16 A Oh, I definitely had the lunch with John Brittain.  
17 There is no doubt in my mind about that. I don't  
18 remember if I correctly identified him as the  
19 engineering manager or the plant manager. At the time  
20 I lunched with him I thought he was the plant manager,  
21 even though I met Mr. Sauter at the time.

22 Q Did you do any work on analyzing the effluents in the  
23 sewer system at the Bloomington plant that you can

1 recall?

2 A Not that I recall.

3 Q Do you remember that being a topic of conversation to  
4 try to measure the amount of PCBs that might be  
5 escaping into the sewer system from the Bloomington  
6 plant?

7 A I recommended to them that they stop discharging PCBs  
8 to the plant. Now, I don't recall proposing to them  
9 that we attempt to monitor how much was leaving via  
10 that route.

11 Q Exhibit 24 is entitled preliminary report. I probably  
12 asked you this. Is there a final report?

13 A No.

14 (A recess was taken during which time Defendant's  
15 Deposition Exhibit 28 was marked for identification.)

16 Q Doctor, Exhibit 18 is the letter you produced to me  
17 last time, June 11, 1976, which, as I understand it,  
18 was written when you were at the EPA; is that correct?

19 A Yes.

20 Q And was it written because Westinghouse wanted you to  
21 perform some consulting work?

22 A Westinghouse did, and I'm trying to clarify whether  
23 there was somebody else as well. But yes, I was

1 essentially requesting permission to do outside  
2 consulting.

3 Q Requesting that of the EPA?

4 A Yes.

5 Q This letter was written to the EPA?

6 A Yes.

7 Q And sent to them; is that right?

8 A Yes, to Christopher Seglem, regional counsel.

9 Q So, as of June 11, 1976 you had indicated to Mr. Seglem  
10 that --

11 MR. McCREA: The letter speaks for itself.

12 Q -- that Westinghouse had performed an environmental  
13 survey of PCB leakage from the plant, from the  
14 Bloomington plant; is that right?

15 A Yes. I state in there that I had performed such a  
16 survey.

17 Q Now, we've just marked your Deposition Exhibit No. 28.  
18 Can you identify this three-page document for us?

19 A It appears to be a follow-up report written by myself  
20 having to do with samples taken around Bloomington.

21 Q Do you have any recollection of drafting this  
22 three-page document?

23 A Vaguely. I remembered there was more fish data than

1 the data which I had seen up to this point.

2 Q When you say that sufficient PCBs are coming down the  
3 White River from Indianapolis to obscure inputs from  
4 our plant via Beanblossom Creek, what was the context  
5 of that statement?

6 Why was that made?

7 A One of the things I was trying to do was alert the  
8 people at Bloomington to the fact that the levels of  
9 PCBs which could be associated to the Westinghouse  
10 plant were high enough that they were easily  
11 discoverable. Now, in that vein I'm saying that the  
12 inputs to the White River from Westinghouse via the  
13 Beanblossom Creek would be somewhat obscured by the  
14 presence of PCBs coming downstream from Indianapolis.

15 Q All right. Let's go to page 3 of Exhibit 28. At the  
16 top is Waverly; is that right?

17 A Yes.

18 Q All right. If you keep going upwards, is that where  
19 you get to Indianapolis?

20 A I believe so.

21 Q And Bloomington doesn't seem to appear on this map,  
22 does it?

23 A I believe it's in that square box with a B in the

1 middle of it just above sample 21.

2 Q I see. Are you aware of any other sources of PCBs  
3 other than Westinghouse downstream from the  
4 Westinghouse plant at Clear Creek?

5 A No, I don't think so.

6 Q If there is a plant in Bedford, a GM foundry in  
7 Bedford, at around the sample point 20 that had been  
8 found to have discharged levels of PCBs, would that  
9 change your opinion at all as to the relative  
10 contribution of the Westinghouse plant to levels found  
11 in Clear Creek?

12 MR. McCREA: Are you suggesting that 20 is  
13 where the White River is located?

14 Bedford is on the White River, not Clear Creek.

15 Q Well, let's redo the question. If there is a GM  
16 foundry at or around point 20 that had levels of PCBs  
17 discharged from it, could that account for levels below  
18 that point of PCBs?

19 A If they were discharging into the stream, they  
20 certainly would be contributing to levels downstream.

21 Q And was your conclusion that the contributions from  
22 Indianapolis into the White River could account for the  
23 levels found in the White River?



1 A I think so. It seemed to me that the White River was  
2 carrying PCBs with it from up toward Indianapolis. So,  
3 upstream of where the Westinghouse inputs would go in  
4 it would seem that there were other sources.

5 Q Can you answer the question No. 2 based on the  
6 information that you developed in Exhibit 28?

7 A Well, if one assumes that there were no other sources  
8 than the sewage treatment plant, the data they give is  
9 indication of the level of contamination downstream.

10 Q Where is the sewage treatment plant on this map?

11 Is that the B, the box with a B in it?

12 A Yes, right in there.

13 Q Is that your understanding?

14 A Yes. It's been 16 years since I've seen this thing.

15 Q Doctor, you took some fish samples at Haysville at  
16 station 8; is that right?

17 A Yes.

18 Q And then you took some other samples below Haysville  
19 also of fish; is that right?

20 A I don't see fish from station 7.

21 Q I don't either. I'm just referring to your statement  
22 at the bottom of the first page.

23 MR. McCREA: Do you have a copy which has

1 the right-hand column at the top of the --

2 MR. FELDMAN: That's more legible, no.

3 A The sample No. 8 possibly station 8, that may possibly  
4 be below. There is a small mouth bass and a shad both  
5 below 5 PPM.

6 Q I don't see the resident fish at 5 parts per million  
7 that you are referring to in that last sentence on the  
8 first page.

9 A Where I say in general the resident fish are higher  
10 than the limit for human consumption?

11 Q Right.

12 A Okay. Well, if you look at samples that are labeled  
13 station 9, there's a small mouth bass at 7.73 parts per  
14 million.

15 Q There's also a catfish at .116.

16 A True. Then on station 11 there's two sunfish I think  
17 that is at 17.8, blue gill at 5.95. I'm assuming  
18 that's what I'm referring to in that last sentence.  
19 And that the fish at station 8 -- that station 8 is  
20 below Haysville.

21 Q But when you say that generally the resident fish are  
22 higher than the limit of 5 parts per million you got  
23 three fish that are higher but many more that are quite

1 a bit lower, don't you?

2 A Many more?

3 Q Well, I mean significantly more that are under 5 parts  
4 per million than above it; isn't that true?

5 A Well, station 9, 11, 15. 15 is at 4.25, if I can read  
6 that right. Oh, I'm sorry. That's a crayfish. That's  
7 not a fish. Okay. So, basically I guess I'm looking  
8 at the two sets of fish at station 11, one is at 5.95,  
9 one is at 17.8, a small mouth bass at station 9 at 7.73  
10 and then the only other fish listed there in that area  
11 is the catfish at .116.

12 Q And sediment is .042 above that at station 9 further  
13 up?

14 A Yes, that's a sediment sample.

15 Q By the time it gets to Haysville it's quite low, isn't  
16 it, 3.39 and .716?

17 A What are you referring to? The fish or the sediment?

18 Q The small mouth bass and the shad.

19 A At?

20 Q Station 8.

21 A 8. Well, 3.39 and .716, I wouldn't call that quite  
22 low. It's below the 5 parts per million.

23 Q Doctor, did the Bloomington plant use 1248?

1 A I don't think so. But as the 1242 formulation, the  
2 Inerteen formulation, weathers in the environment it  
3 then is best quantitated as 1248 because the pattern of  
4 the peaks shifts as the material biodegrades.

5 Q Does it biodegrade if it's in a fish?

6 A It probably biodegraded before it got to the fish.

7 Q There is a dam at the Williams station, is there not?

8 A I don't know.

9 Q If there were a dam at the Williams station, would that  
10 have any effect on PCB values below that point?

11 A Could. It depends upon what's happening and how the  
12 material is being transported.

13 Q Did you do samples of sheep, sheep parts?

14 A That rings a faint bell, but I can't think in what  
15 connection.

16 Q Is that your answer?

17 You sounded like you were going to say something  
18 else. We're all waiting breathlessly.

19 A Yes. Unfortunately the gray cells have failed me.  
20 Vaguely I recall something having to do with sheep, but  
21 I can't remember what it was.

22 Q Doctor, in Exhibit 15 which was marked at your first  
23 session, for the record that's Plaintiff's Answers to

estinghouse Electric Corporation Supplemental Interrogatories Concerning Expert Testimony, the plaintiffs indicate that you will testify that you informed personnel at the Bloomington plant that precautions were necessary to prevent the further escape of PCBs from the Bloomington plant. Dr. Munson will testify that his recommendations were not acted upon because of the costs involved.

You don't really know, do you, whether your recommendations were acted upon after you left Bloomington?

I guess I just know what I was told, that they wouldn't be. Now, whether they were or not, I don't know. You don't know that your recommendations were not acted upon and you really don't know what was done at the plant after you left to reduce discharge to the environment, do you?

MR. McCREA: He's answered it yes.

Right. Of my own knowledge, I don't know. True.

Well, you say of your own knowledge. Has someone informed you of that other than me since you left the Bloomington area in 1972?

Mr. McCrea has told me various things about what took

1 place at the plant.

2 Q What did Mr. McCrea tell you about what took place at  
3 the plant?

4 A That liquid wastes were put down the sewer.

5 Q Did he tell you anything else?

6 A On this particular topic he told me the drains were  
7 welded shut at one point. There was an employee who  
8 was instructed to come in in the middle of the night  
9 and pour liquids down the drain. That's all I can  
10 remember on this particular topic.

11 Q Did he tell you who the employee was who was instructed  
12 to come in in the middle of the night and pour  
13 materials down the drain?

14 A If he did, I don't remember his name.

15 Q Did he provide any other details concerning  
16 Westinghouse's pouring of Inerteen down the drain at  
17 the plant?

18 A I don't think so.

19 Q Did he provide you with any information concerning  
20 other measures other than sealing the drain to reduce  
21 the discharge of PCBs into the environment?

22 A I don't remember any.

23 MR. FELDMAN: Let's take a real short

1 break.

2 (A recess was taken.)

3 Q Doctor, in the disclosure of your opinion, sir, likely  
4 testimony, the document indicates that you will testify  
5 that it was unconscionable for Westinghouse not to  
6 communicate the information in his report to Dale and  
7 Connie Conard who had maximum exposure to the PCB  
8 contamination.

9 Is that a correct characterization of your opinion  
10 as you sit here today?

11 A Yes. I think so. They had an opportunity to do it and  
12 should have done it.

13 Q What should Westinghouse, in your opinion, have told  
14 the Conards in 1972?

15 A Well, at that point or later they should have told them  
16 about the movement of PCBs away from the landfill onto  
17 their property.

18 Q What would that information have meant to Dale and  
19 Connie Conard in 1972?

20 A How do I know.

21 Q The answer is you don't know, do you?

22 A No, I don't know. But I do believe they had a right to  
23 know that.

1 Q Doctor, another thing that you are supposed to testify  
2 to, according to Exhibit 15, is the risks of the  
3 cleanup at Neal's Landfill and the adverse impact which  
4 the cleanup will have on the Conard property.

5 What are the risks of the clean up at Neal's  
6 Landfill, in your opinion?

7 A The risks are that there will be overflows and spills  
8 that will flood across the Conard property.

9 Q Is that also the adverse impact which the cleanup will  
10 have on the Conard property?

11 A Well, the adverse impact will be what one might expect  
12 from contaminating their farm with PCBs.

13 Q Which is what?

14 A Making it unsuitable for farm animals, for agriculture.

15 Q Anything else?

16 A Probably won't do their health any good.

17 Q Why do you say that?

18 A Because they live there.

19 Q Why does their living there indicate that that won't do  
20 their health any good?

21 A Well, because I seriously believe that living on land  
22 contaminated with PCBs is bad for your health. I think  
23 that's well documented.



1 Q I told you I'd do this, and I want to keep my promise.  
2 That's also an area in which you have no expertise; is  
3 that true?

4 A It's general knowledge. I read the newspapers.

5 Q I've looked at everything that I was given in  
6 connection with your deposition and find no information  
7 in there on the manner of the cleanup at Neal's  
8 Landfill.

9 Is it fair to say that you have reviewed none of  
10 the documents that describe the manner in which PCBs  
11 will be removed from Neal's Landfill?

12 A That's true.

13 Q Are you aware of the remedial measures that have  
14 already been taken at Neal's Landfill?

15 A I'm aware of some of them, yes.

16 Q What are they?

17 A I believe there was a clay cap put on and some sort of  
18 sediment fence that seems to break with some regularity  
19 and allows the sediment to run through anyway. I know  
20 they came in and stripped Conard's Branch considerably  
21 taking out sediments. And I presume there's no further  
22 dumping at the landfill.

23 Q Are you aware of whether any of the measures that have

1 already been taken at Neal's Landfill have caused any  
2 adverse impact on the Conard property?

3 A Well, certainly the stripping of the creek didn't do it  
4 any good. It used to be a creek. It's now a giant  
5 drainage ditch.

6 Q Will that have any adverse impact on the Conards'  
7 health?

8 A I don't know.

9 Q You think it might?

10 You have no information one way or the other as to  
11 whether that will have any adverse impact on their  
12 health?

13 A No, I don't.

14 Q What were the representations of Monsanto to the fact  
15 that Aroclor 1016 does not bio-accumulate?

16 A Basically the claim was that it was biodegradeable  
17 because the higher chlorinated isomers had been removed  
18 from the preparation and therefore would not  
19 bio-accumulate.

20 Q What is the relationship between biodegradation and  
21 bio-accumulation?

22 A Well, basically if the input of the material into the  
23 biological system is slow enough and the material is

1 biodegradeable, what will happen is the biological  
2 system will digest the material away and it won't be  
3 available to be accumulated into organisms and then  
4 bio-magnified up the food chain.

5 Q If the organism takes in PCB, even if the PCB is less  
6 biodegradeable than other formulations, won't it  
7 bio-accumulate just as much as other formulations which  
8 are more or less biodegradeable?

9 A I'm not sure your question makes any sense.

10 Q All right. Let me do it again. I'm sorry. If an  
11 organism ingests 1016, at that point isn't its tendency  
12 to bio-accumulate fixed and wouldn't be any different  
13 from a higher chlorinated formulation?

14 A It would probably if the 1016 were biodegradeable more  
15 so than the 1254. The organism would probably  
16 accumulate the 1016 to a lower amount.

17 Q Why is that?

18 A Because both processes are going on at the same time.  
19 It's like filling a tank with a little hole in the  
20 bottom. If you patch the hole, the tank fills faster.  
21 So, if the organism is not biodegrading the material at  
22 the same time it's taking it up, it will take it up  
23 more.

1 Q You're saying the organism itself biodegrades the 1016?

2 A Some of them do, yes.

3 Q What was the major PCB spill into the river near the  
4 Westinghouse plant in Sharon, Pennsylvania, that you're  
5 going to testify to?

6 A What was it?

7 Q Yes.

8 A Are you asking how did it occur or what formulation it  
9 was or what?

10 Q No. What actually occurred?

11 A A large storage tank was being removed for scrap. It  
12 was lifted. The description sounded like they were  
13 lifting it with a crane. It was thought to be empty.  
14 And a plug in the bottom of the tank that was rusted  
15 fell out. And I was told somewhere in the order of two  
16 or three thousand gallons of PCB came out of the tank.  
17 went into an adjacent storm drain and directly into the  
18 river.

19 Q Did you actually see the storm drain that the tank had  
20 drained into?

21 A I saw the pipe in the river. I didn't see that part of  
22 the plant.

23 Q Is it your understanding that the drain is just a

1 direct conduit into the river?

2 A Yes.

3 Q And that it was that way at the time of the spill?

4 A Yes.

5 Q What was the tank holding?

6 A Whatever PCB formulation they were using.

7 Q Was it waste Inerteen or was it --

8 A I don't think it was waste. Well, I guess I don't know  
9 for sure. It was described to me as being PCB.

10 Q Based on what you were able to determine do you know  
11 the level of PCB in the fluid in that tank before it  
12 spilled into the drain?

13 A No.

14 Q Were you given any information about the use of PCBs to  
15 control weeds around Bloomington?

16 A No. Oh, you said weeds. I was thinking you were  
17 talking about spraying around the plant. Yes, I was  
18 told about dumping Inerteen in a lake to control the  
19 aquatic weeds.

20 Q Who gave you that information?

21 A I don't remember. It was someone who was driving me  
22 around.

23 Q What did this person tell you about the use or about

1 pouring PCBs into a lake for weed control?

2 A Said they had tried it as an experiment because they  
3 thought it might kill the weeds.

4 Q Who had tried it?

5 A It's my understanding it was somebody from the  
6 Westinghouse plant had done this in this little lake.

7 Q Where was the lake?

8 A I don't know the exact location of it. David and I  
9 found it driving around one day.

10 Q How do you know that you found it?

11 A Because we drove down this road, and I remembered the  
12 layout of a lake on the right and a lake on the left.  
13 Although, the one on the left isn't a lake anymore.  
14 It's been drained.

15 Q Have you told me all that you were told about the  
16 experiment to control weeds by using Inerteen in this  
17 lake in Monroe County?

18 A Yes, basically that's all my recollection was. I was  
19 told they put PCBs in the lake to control the weeds.

20 Q Did Mr. McCrea have any information about that event?

21 A I don't think so.

22 Q Had he talked to anybody who could report on it?

23 A If he has, he hasn't mentioned it to me.

1 Q According to the statement submitted to the court, you  
2 will also be testifying to an on-site visit to the  
3 Conard property. I know you told me that you had had  
4 such a visit.

5 What exactly did you do at the Conard property  
6 when you visited it?

7 A Walked around, looked at Clear Creek, chatted with the  
8 Conards --

9 Q Excuse me. Looked at Clear Creek?

10 A Conard's Branch. Pardon me. And they showed me a  
11 deformed piglet.

12 Q Was the piglet dead?

13 A Yes, it had been in the freezer.

14 Q Who showed you the piglet?

15 A I think Connie did.

16 Q Did she say anything about any other pigs that had been  
17 deformed on their property?

18 A Yes, she said there had been many.

19 Q Did she tell you how many?

20 A Oh, at one time or another I'm sure somebody has said  
21 that. I've heard, I think, hundreds, maybe thousands,  
22 something like that.

23 Q Do you know what the age of the piglet that was frozen

1 that was shown to you was?

2 Not the age that it was but when it died.

3 A No.

4 Q Did anyone ever describe to you an incident in the late  
5 '60s or early '70s in which an oily substance came  
6 through Conard's Branch from Neal's Landfill?

7 A I have heard that that took place, yes.

8 Q Who did you hear that from?

9 A Well, I think Dale has mentioned to me that during  
10 periods of very high flow he's had occasions when the  
11 creek has gone over its banks and left an oily  
12 substance.

13 Q Did anyone tell you that some of the pigs that had been  
14 in the creek around the time of that incident or one of  
15 those incidents developed blisters and had offspring  
16 that had to be destroyed?

17 A I don't remember that story specifically.

18 Q Is it your understanding that the deformed pig that  
19 Mrs. Conard showed you related to one of those  
20 incidents?

21 A She didn't say.

22 Q You didn't ask her?

23 A I didn't ask her.



1 Q What did the pig look like?

2 A I think this particular one was notable for having sort  
3 of a double mouth, two snouts, I think, if I remember  
4 right.

5 Q Was that the only pig you saw?

6 A Yes.

7 Q And it's your understanding that pig was born on the  
8 Conard farm?

9 A I think so.

10 Q Is it your understanding that there are more frozen  
11 pigs that look like that?

12 A I don't know how many frozen pigs there are. I've seen  
13 that one. I've been told that over the years there  
14 have been many of them.

15 Q And you came away with the opinion based on what you  
16 had been told that there were hundreds, possibly  
17 thousands, of deformed pigs; is that right?

18 A I don't know if I was given that statement at that time  
19 or whether that's occurred later. But somebody gave me  
20 the estimate that there were surely hundreds and  
21 perhaps thousands.

22 Q Did anyone tell you about any efforts to seek advice  
23 from veterinarians as to the cause of those deformed

1 pigs?

2 A I think so.

3 Q What was told to you?

4 A I think Dale mentioned to me that over the years he had  
5 shown a number of the pigs to the local veterinarian.

6 Q And what response had he gotten, according to Mr.  
7 Conard, from the veterinarian?

8 A If I remember correctly, I don't think the veterinarian  
9 knew what was causing the problem.

10 Q Any other efforts, to your knowledge, to determine what  
11 had caused the problem with the pigs?

12 A Not that I am aware of.

13 Q Did you ask anyone whether any of those pigs had been  
14 sampled for PCBs?

15 A I don't remember if I asked that about the pigs.

16 Q In your interview with Mr. McCrea in his office that  
17 was recorded by a court reporter you refer to an  
18 incident in one of the plants where you observed an  
19 individual filling capacitor cans.

20 Do you recall that?

21 A Yes.

22 Q Do you think that was in the Bloomington plant?

23 A I think so. But I can't swear to it.

1 Q Would that have been at or about the time of your  
2 sampling in 1972?

3 A Yes.

4 Q Physically how was he filling the capacitor can?

5 A The person I saw was using a nozzle that looked like  
6 the nozzle you would fill the tank on your car. I  
7 can't remember for sure that it was a capacitor can or  
8 perhaps a small transformer. So, I'm not sure that it  
9 was Bloomington, say, and not South Boston.

10 Q Can you tell the difference between a capacitor and a  
11 transformer?

12 A Possibly if you put them in front of me today. My  
13 recollection as to 17 years ago is a little fuzzy.

14 Q Could you smell the Inerteen at that time?

15 A Yes.

16 Q Do you know what's the lowest concentration of PCBs  
17 that you can actually detect by smell?

18 A No, I don't. But I guess it's very low.

19 Q Why do you guess that?

20 A The human nose is one of the most sensitive chemical  
21 detectors. Well, a dog's nose is probably the most.

22 Q Had you ever smelled it in any of the samples you took  
23 around Bloomington?

1 A Some of them.

2 Q Where?

3 A I took some around the plant that were, I think, on a  
4 percent basis of Inerteen.

5 Q Any of the ones you took around the landfills or the  
6 sewage treatment plant could you smell the Inerteen?

7 A I don't think so.

8 Q Also in your interview with Mr. McCrea that was  
9 reported by a court reporter and it's been marked as  
10 Exhibit 13 in this deposition you indicated that you  
11 were concerned that people eating fish that were over 5  
12 parts per million could have adverse health effects.

13 Is that an accurate statement of your opinions?

14 A I think so.

15 Q Have you reviewed any studies that indicate that people  
16 who eat fish with 5 or more parts per million in the  
17 edible portion have adverse health effects?

18 A I assume the FDA knew what they were doing when they  
19 set the limit. I don't recall any human studies.

20 Q Are you aware of any human studies that indicate that  
21 even though people who eat that fish with those  
22 quantities of PCBs may accumulate them in their bodies  
23 they don't have any adverse health effects as a result?

1 A I don't recall reading any studies like that.

2 Q At another point in the same statement referring to the  
3 work you did around Neal's Landfill you state -- This  
4 is on page 30 -- I really felt like the information  
5 should have been made public. I agonized over it at  
6 some length in the early 1970s and finally, as I'm sure  
7 many others, decided that I could not stand the risk of  
8 losing my career at Westinghouse by bringing that  
9 information forth. So, I didn't do so.

10 Who else other than you, to your knowledge,  
11 agonized over the possibility of risking their career  
12 if they brought that information forth?

13 A One of the fellows who sampled with me, Carl Armour,  
14 shared my concerns. He worked for the Westinghouse  
15 environmental division.

16 Q How do you know he shared your concerns?

17 A Because we talked about it.

18 Q What did he tell you?

19 A He had the same concern as myself that we should make  
20 the information public, but we didn't dare to.

21 Q When did he tell you that?

22 A When we were doing the study.

23 Q Do you know where Mr. Armour is today?

1 A I haven't a clue.

2 Q Did he tell you that he couldn't stand the risk of  
3 losing his career at Westinghouse if he disclosed that  
4 information?

5 A I don't know if he used those exact words.

6 Q Did he use words to that effect?

7 A I think so.

8 Q You found a level of 6,300 parts per million in the  
9 soil around the plant; is that correct?

10 A Yes.

11 Q And to your knowledge what are the risks to human  
12 beings of a level like that around the plant?

13 A It depends upon what they do with it. To the people  
14 who were working inside where the PCBs were it probably  
15 didn't mean a thing. They had much higher exposures  
16 inside. If it was on a playground where my kids were  
17 playing ball, I wouldn't like it much.

18 Q Was it on a playground where kids were playing ball?

19 A I don't think so.

20 Q Was there any activity in the area, to your knowledge,  
21 that the 6,300 parts per million samples were taken?

22 A I don't think so.

23 Q What about later?

1 A I don't know about later.

2 Q Have you visited the Westinghouse plant since you met  
3 Mr. McCrea?

4 A No.

5 Q Driven by it?

6 A I've been by it.

7 Q Did you go onto the property?

8 A No.

9 Q What did you observe?

10 A Just drove by the building and looked at it.

11 Q Who is Renate Kimbrough?

12 A I believe she's a -- Let's see. I think she's a  
13 toxicologist with the Center for Disease Control.  
14 maybe.

15 Q You're not sure who she is?

16 A I don't remember her exact title and where she is.  
17 I've heard her speak several times..

18 Q Has she done work on PCBs?

19 A I think so.

20 Q Have you ever read anything of hers on PCBs?

21 A Probably.

22 Q Do you consider her to be an authority on the health  
23 effects of exposures to PCBs on humans and animals?

1 A I'm not sure exactly what her area of expertise is. I  
2 haven't read any of her stuff recently.

3 Q So, you don't have an opinion as to whether she's an  
4 authority or not on the health effects of PCBs?

5 A I really can't remember. I heard her speak some years  
6 ago. But I can't remember exactly what her area of  
7 expertise is.

8 Q If I were to tell you that in a report, study, that she  
9 drafted in 1987, the Annual Review of Pharmacological  
10 Toxicology, if I were to tell you that Dr. Kimbrough in  
11 that paper stated that no significant chronic health  
12 effects have been causally associated with PCBs or  
13 PPBs, would you have any reason to doubt the truth of  
14 that statement?

15 A I'm sure she believes it. I think she's wrong.

16 Q What materials do you rely on in support of your  
17 opinion that Dr. Kimbrough was wrong on that statement?

18 A Basically the problem is any time you get a plant like  
19 Bloomington and you look at the number of people in it  
20 who work there who get ill, folks like Renate Kimbrough  
21 do not consider that a causal relationship because the  
22 sample size is too small.

23 But if you just look at the number of people and



1 the illnesses they've got, your common sense tells you  
2 there's something wrong there. And I'm convinced for  
3 the levels those workers were exposed to their health  
4 was adversely affected regardless of what Renate  
5 Kimbrough says.

6 Q And regardless of whether those illnesses establish a  
7 statistically significant correlation with PCB  
8 exposure; is that right?

9 A The problem is I don't think there is enough data to  
10 establish that correlation. If the statistics say you  
11 have to have 200 people in your sample set, you only  
12 got 20 and they call die, there is no correlation.

13 Q You don't have any expertise in the area of statistical  
14 studies of sample populations who have had certain  
15 kinds of exposures to toxic substances, do you?

16 A No. You keep asking me these questions, and I keep  
17 answering them.

18 Q I appreciate that, Doctor. And that's a new question.  
19 You'll have to give me that one. What are the primary  
20 studies in the literature on the chemical properties of  
21 PCBs?

22 A I don't know. I haven't reviewed the literature  
23 recently.

1 Q What about the mechanism of bio-accumulation and  
2 bio-magnification of PCBs in organisms?

3 A I can't cite you the literature.

4 Q You anticipate providing testimony on the mechanisms of  
5 bio-accumulation and bio-magnification and the chemical  
6 properties of PCBs, do you not, according to your  
7 statement that's been submitted to the court?

8 A Quite likely.

9 Q You don't anticipate citing any documents in support of  
10 the opinions that you will testify to on that topic?

11 A I may.

12 Q But you can't cite me any as we sit here today?

13 A No.

14 Q Do you intend to review the literature before you  
15 testify?

16 A I probably will.

17 Q The last time you reviewed the literature was when?

18 When you were working for the EPA?

19 A Probably, yes. About that time.

20 MR. McCREA: Would you please read that  
21 statement into the record just --

22 MR. FELDMAN: It says Dr. Munson will  
23 describe the chemical properties of PCBs, the

1 mechanisms of bio-accumulation and bio-magnification.

2 MR. McCREA: Is there anything else?

3 MR. FELDMAN: No. There are other  
4 statements.

5 Q Let me read another one. Dr. Munson will testify as to  
6 the risks of the cleanup at Neal's Landfill and the  
7 adverse impact which the cleanup will have on the  
8 Conard property.

9 Can you cite me any documents or studies in the  
10 literature which you would rely on in support of your  
11 testimony on that issue?

12 A No. I can probably go mainly on my experience and  
13 studying the movement of PCBs.

14 Q So, you can't cite me any studies on that topic; is  
15 that right?

16 A I could dig a couple out of my resume if you wanted  
17 them. But I can't cite them chapter and verse as we  
18 sit here, no.

19 Q Would you do that?

20 A I don't think we have time for that, Jan.

21 Q You have to leave at 4:15. It's only 5 after.

22 MR. McCREA: We provided you with a  
23 written statement as to his testimony.

1 MR. FELDMAN: But you didn't provide me  
2 with what I asked for which is the material he relies  
3 upon in support of his statement. All you said was  
4 what he's going to say. You never provided me with the  
5 material he relies on in support of his testimony.

6 MR. McCREA: Jan, he gave us a statement  
7 on that which has been furnished to you.

8 MR. FELDMAN: Which also doesn't include  
9 any supporting literature.

10 MR. McCREA: It certainly does. And the  
11 position of Westinghouse that you can only test to 1  
12 part per billion is erroneous.

13 MR. FELDMAN: What does that have to do  
14 with the risks of cleanup and the adverse impact on the  
15 Conard property?

16 MR. McCREA: The safe level is 0.00079  
17 parts per million which we have furnished to you in our  
18 documents. What you're saying is higher than what the  
19 EPA says is safe. Dr. Munson is going to testify that  
20 you can only test 1 part per billion is erroneous.  
21 It's been that way for years.

22 MR. FELDMAN: David, when I asked about  
23 what that statement meant he told me about the effects

1 of the cleanup on the removal of sediment at Neal's  
2 Landfill and had nothing to do with parts per trillion.

3 MR. McCREA: True. He's described that.  
4 We have given you a report that this position of yours  
5 that you can only test at 1 part per billion is  
6 hogwash. And he has given you a report on that.

7 MR. FELDMAN: Just want to see if you  
8 agree with that, Howard.

9 Q He is referring to actually the only remedial action at  
10 Neal's Landfill. Let's leave out for the moment the  
11 parts per trillion issue. What I'm asking you is:  
12 What studies can you cite me in support of your  
13 statement that the remedial action that will be  
14 performed at Neal's Landfill would have an adverse  
15 impact on Conards' property?

16 A Basically I was going to respond in the regard of the  
17 movement of the materials to their property. Now, if  
18 you don't accept it as a given that covering their  
19 property with PCBs is an adverse impact, then we've got  
20 a problem.

21 Q I don't, but let me just ask you if you can tell me  
22 what studies you would rely on in support of your claim  
23 that the remedial action will result in the movement of

1 PCBs onto their property.

2 A Okay. Well, I will be referring to the studies that I  
3 did when I was at Westinghouse in the Upper Chesapeake  
4 Bay, movement of chlorinated hydrocarbons in Chesapeake  
5 Bay.

6 Q How does that relate?

7 How does that study relate to what's going to  
8 happen at Neal's Landfill when they do the remedial  
9 action?

10 A It shows the movement of chlorinated hydrocarbons fixed  
11 to sediments, suspended sediments, which then settle  
12 down into stream sediments. It shows that the PCBs  
13 distribute through the ecosystem, through the aquatic  
14 ecosystem. I think all of that is pertinent to what's  
15 going to happen at Conards'.

16 Q Is there any study you will rely on in support of your  
17 testimony in which there was a cleanup removal of soils  
18 that may have been contaminated with PCBs and then an  
19 analysis of possible movement of PCBs out of that  
20 remedial action cite?

21 A No. I don't have such a study, and I don't think we  
22 need it.

23 Q Now, I interrupted you before, and you were going to

1 tell me other studies that you would rely on in support  
2 of your statement. You started off with the Bay study.

3 A Well, previous to that we did a similar study in the  
4 Chester River in Maryland. There were several other  
5 published reports having to do with chlorinated  
6 hydrocarbons in the Chesapeake Bay.

7 Q None of those were situations where there was a cleanup  
8 of sediment that contained PCBs, were there?

9 A No. I already said that.

10 Q You said that as to the first study, not to the  
11 subsequent ones.

12 MR. FELDMAN: I have nothing further.  
13 Doctor. Thank you for your time.

14 MR. McCREA: I have one question.

15 CROSS EXAMINATION,

16 QUESTIONS BY MR. DAVID S. McCREA:

17 Q Dr. Munson, did you do a study on the bio-accumulation  
18 of Aroclor 1016 and did you ask Westinghouse to publish  
19 that study?

20 If so, what was the result?

21 A Oh, I didn't do a study. I observed it in some  
22 organisms in the South Boston survey. We saw a clear  
23 case of bio-accumulation of MCS 1016 in some freshwater

1 clams, I believe they were. And that information is  
2 affixed to the South Boston report. Westinghouse would  
3 not let me publish that information.

4 Q Did they give you a reason?

5 A They didn't want anyone to know we had done the survey  
6 around South Boston.

7 MR. McCREA: No questions. Thank you.

8 REDIRECT EXAMINATION,

9 QUESTIONS BY MR. FELDMAN:

10 Q Doctor, the South Boston report was the one that you  
11 indicated was disclosed at some point, was it not, to a  
12 state agency?

13 A My understanding is it was disclosed to a state agency,  
14 yes.

15 Q So that if Westinghouse didn't permit you to publish  
16 it, in any event it was made public at some point;  
17 isn't that correct?

18 A I would quibble as to whether that is making it public.

19 Q Well, in any event, the state of Maryland received it;  
20 isn't that correct?

21 A Someone in the state of Virginia saw it. Now, whether  
22 they received it or not may be something else again.

23 MR. FELDMAN: That's all I have.



1 Q Dr. Munson, I would like you to read this deposition  
2 and determine that the court reporter took your words  
3 down accurately. Will you agree to review the  
4 transcript and ensure that in your opinion she took  
5 down your words and maybe my words, too, accurately and  
6 then sign the transcript with any corrections you have  
7 to make?

8 A Yes, I'd be happy to.

9 Q You understand you cannot change your testimony. But  
10 if she took the words down mistakenly, you can change  
11 that. Is that understood?

12 A I understand that.

13 MR. YOUNG: Let the record also show that  
14 the defendants will pay the witness for his time in  
15 preparing and in testifying and in reviewing the  
16 deposition.

17 MR. FELDMAN: I don't accede to that. I  
18 certainly don't stipulate to that.

19 MR. McCREA: We'll have to take this  
20 matter up with the judge.

21 AND FURTHER THE DEPONENT SAITH NOT.  
22

23

DR. THOMAS OREN MUNSON

1 STATE OF INDIANA )  
 ) SS:  
2 COUNTY OF MARION )

3 I, Beverly S. Evans, a Notary Public in and for  
4 the County of Marion, State of Indiana at large, do hereby  
5 certify that DR. THOMAS OREN MUNSON, the deponent herein,  
6 was by me first duly sworn to tell the truth, the whole  
7 truth, and nothing but the truth, in the aforementioned  
8 matter;

9 That the foregoing deposition was taken on behalf  
10 of the Defendant in the law offices of Baker & Daniels, One  
11 Indiana Square, 15th Floor, Indianapolis, Marion County,  
12 Indiana, on the 30th day of December, 1988, commencing at  
13 the hour of 10:58 a.m., pursuant to the Federal Rules of  
14 Civil Procedure;

15 That said deposition was taken down in stenograph  
16 notes and afterwards reduced to writing under my direction,  
17 and that the typewritten transcript is a true record of the  
18 testimony given by said deponent, and thereafter presented  
19 to said witness for his signature:

20 That the parties were represented by their counsel  
21 as aforementioned.

22 I do further certify that I am a disinterested  
23 person in this cause of action; that I am not a relative or

1 attorney of any of the parties, or otherwise interested in  
2 the event of this cause of action, and am not in the employ  
3 of the attorneys for any of the parties.

4 IN WITNESS WHEREOF, I have hereunto set my hand  
5 and affixed my notarial seal this 6th day of December,  
6 1989.

7  
8  
9  
-----  
10 BEVERLY S. EVANS, Notary Public

11 My Commission Expires:  
12 September 29, 1990.

13 County of Residence:  
14 Hancock.

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21

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EXCERPTS FROM T.O. MUNSON FILE

1. Memo; February 24, 1971, R. D. McClain, Manager, Capacitor Unit Engineering, Westinghouse Bloomington Plant, to D. M. Sauter, Manager, Distribution Apparatus Division, Westinghouse Bloomington Plant, re: visit of T.O. Munson
2. T.O. Munson, "Preliminary Report of Inerteen Environmental Survey at Bloomington Distribution Apparatus Plant"
3. T.O. Munson, "Summary of Follow-Up Sampling at Bloomington"
4. Memo; October 18, 1972, 1971, R. D. McClain, Manager, Capacitor Unit Engineering, Westinghouse Bloomington Plant, to Dr. H. Wilber Speicher, Headquarters Industrial Hygiene [Westinghouse], re: "vital effort" documents on Westinghouse's PCB problem, w/ attachment, "Status of Polychlorinated Biphenyls 4/6/72"
5. Excerpts from Deposition of T.O. Munson [vol. III - December 30, 1988]
6. Excerpts from Statement of T.O. Munson [August 13, 1988]
7. Letter; Roger E. Wills, JR., Attorney, Westinghouse, to Stephen R. Wassersug, U. S. EPA, re: response to "308 letter" by Westinghouse
8. Curriculum Vitae of T.O. Munson

W8



E

BLOOMINGTON WORKS

Mr. D. M. Sauter, Manager  
Distribution Apparatus Division

From : BLOOMINGTON WORKS  
WIN  
Date : FEBRUARY 24, 1971  
Subject : INERTEEN - POSSIBLE  
ENVIRONMENTAL  
POLLUTION

cc: Mr. J. B. Brittain, D.A.D. Engineering Manager

1. John Rissinger, Sharon, called and asked that I tell you that Dr. Hughes and Dr. Manson of the Environmental Systems, (Annapolis) will call to discuss making a study of P.C.B.'s in Bloomington area streets, streams, sewers etc. It is my impression that their study will magnify the problem and not offer practical solutions or suitable alternatives.
2. At the NEMA meeting in Chicago, yesterday, he reported increasing concern evidenced by (a) legislation pending in Massachusetts calling for severe fines against anyone allowing PCB's into environment, and (b) G.E. reluctance to use MCS-1016 in transformers if it cannot be rated "nonflammable". He also reported that Bill Papageorge of Monsanto has been requested to serve on proposed ANSI task force (which should be authorized by letter ballot in mid March).
3. Paul Benignus, of Monsanto, will be in Bloomington, February 25, to review the Chicago meeting and to discuss their plans for converting from Aroclor 1242 to MCS 1016.

R. D. McClain, Manager  
Capacitor Unit Engineering

RDMcC/w1

COPY

PRELIMINARY REPORT OF INERTEN ENVIRONMENTAL  
SURVEY AT BLOOMINGTON DISTRIBUTION APPARATUS PLANT

Prepared by:

T. O. Munson  
Manager Aquatic Biological Sciences  
Westinghouse Ocean Research Laboratory

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Bloomington

R. Sawyer  
Superintendent of Manufacturing Engineering

905011

①

PRELIMINARY REPORT OF INERTEEN ENVIRONMENTAL  
SURVEY AT BLOOMINGTON DISTRIBUTION APPARATUS PLANT

I. Background

The initial sampling at Bloomington was done in mid-October, 1971 by personnel of the Westinghouse Ocean Research Laboratory and the Westinghouse Environmental Systems Department.

The Bloomington portion of the Inerteen Environmental Survey has as its main objectives to determine if Westinghouse activities in Bloomington have caused readily identifiable leakages of Inerteen (polychlorobiphenyl--PCB) to the environment, and if so, to identify the sources of the material so that suitable corrective actions can be taken.

As a result of previous discussions with plant personnel, at the time of sampling, certain potential trouble areas had been identified.

Inerteen appeared to leave the Westinghouse property by five routes: 1) shipment in sealed units enroute to the customer; 2) washing into the sanitary sewer during cleaning of finished units; 3) transporting of impregnated solid waste to sanitary landfill; 4) leaching from spills external to the building; and 5) shipment of waste liquids to Monsanto for reclaiming. Routes 2, 3, and 4 appeared to be the potential sources of trouble.

II. Results and Discussion

1. Movement of Inerteen via the Sanitary Sewer.

Until very recently (the last six months), during the manufacturing process capacitor cans were coated on the outside with

Inerteen which was removed by a washing process draining directly into the plant's sanitary system. This waste went into the Bloomington sewage works south of town. Two sewage treatment plants are located about one mile apart with effluents into Clear Creek (it is unclear whether the Westinghouse effluent goes into only one of these plants or both). The possible movement of Inerteen into Clear Creek was disturbing because Clear Creek meanders southward 12-15 miles and empties into the Monroe Reservoir--a large recreation area and Bloomington's source of water. Figure 1 shows the locations of the samples taken from Clear Creek. These samples very definitely show substantial movement of Inerteen into Clear Creek (the chromatograms were identical to the Inerteen used in the plant). An important point to notice is the drop from 64.2 parts per million (ppm) in B2 to 2.81 ppm in B3 further downstream. A sample (B15A) taken further downstream in the Monroe Reservoir about one mile from the intake to the Bloomington water supply shows 0.80 ppm of a similar pattern. More importantly, the tissue of an adult, carnivorous fish taken from the reservoir exhibited only low levels of the type of PCB found in fish from fairly clean water.

It would appear that, although substantial amounts of Inerteen were added to Clear Creek from the Westinghouse plant, this creek has a high enough bacterial population and sediment load due to the inputs from the sewage treatment plants to serve as a fairly effective biological filter for removing the Inerteen before it reaches the Monroe Reservoir. The creek also appears to have a limited food-chain which does not include fish so that movement of Inerteen from the creek to humans seems rather unlikely.



Thoomington

BL1  
(6.8 fpm)

Sewage Treatment  
Plant

Winslow Rd.

S. Rogers

Sewage Treatment  
Plants

Rhorer Rd.

BL2  
(4.2 fpm)

Clear Creek

Hiway 37

Ketchum Rd.

Although the level of PCB's is about 50 times above the anticipated background for a clean lake, the fish sample does not reflect this fact. The manner in which the PCB moves into the reservoir from Clear Creek may prevent it from moving up the food-chain. Additional samples should probably be taken, however, to strengthen this point.

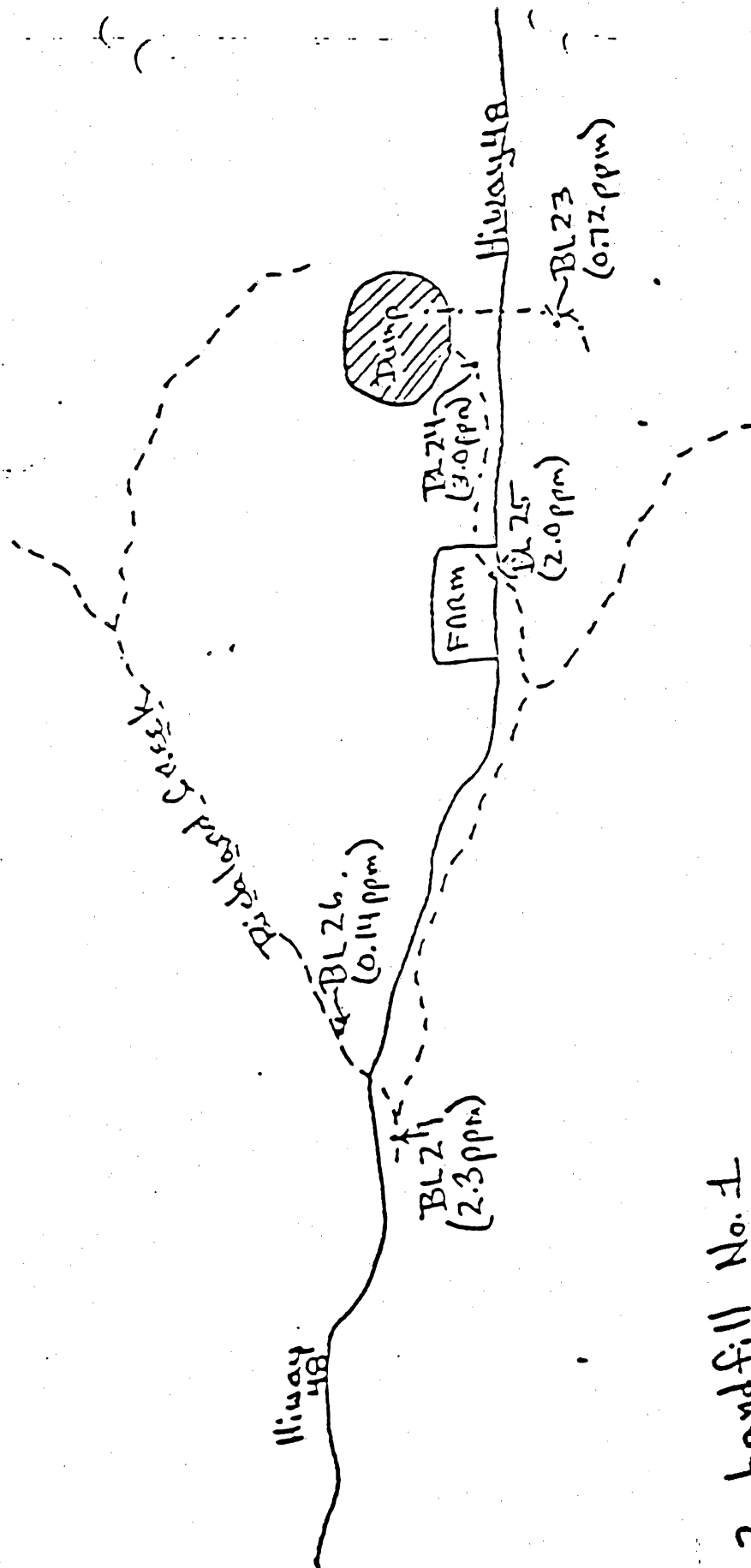
## 2. Movement of Inerteen from Sanitary Landfills.

Three widely separated sanitary landfills have been used for Inerteen disposal and, because each represents a very different situation, they will be discussed separately.

### 2.1 Sanitary Landfill Number 1.

During the approximate period 1957-1967, both solid and liquid Inerteen wastes were removed from the plant by an independent contractor for disposal in a sanitary landfill located on a side-hill adjacent to Highway 48 about three miles west of the plant. Although at that time this procedure was an accepted practice, the results have been rather unfortunate.

Figure 2 shows the locations of some of the samples taken from this landfill area. Samples B24 and B25 were taken from a gully which collects any leachates from the landfill, passes through an animal farm and joins Richland Creek. Judging from the 3.0 ppm just below the landfill, the 2.0 ppm on the edge of the farm and 2.3 ppm in the downstream position of Richland Creek, substantial Inerteen leaches from the landfill. The samples showed a complex pattern of PCB residues, probably due to biological degradation. A fish (Fish 1A) seined from Richland Creek contained 3.8 ppm of a similar PCB residue pattern.



2 Landfill No. 1

Two of the samples were rather confusing: an upstream sample on Richland Creek (B26) contained 0.14 ppm Inerteen (about 10 times what one would expect from "background" environmental fallout) and a soil sample (B23) taken on a side-hill across from the landfill contained 0.72 ppm. One possible explanation was aerial fallout from the landfill, and, when inquiries yielded the information that the landfill operator had been cited on several occasions for open burning, additional samples were taken on the hillsides surrounding the landfill in June, 1972.

Figure 3 presents data from these samples taken around the landfill. Although none of the samples is alarmingly high, the samples north and south of the landfill show levels about five times higher than would be expected if aerial fallout had not taken place. Runoff from the slightly contaminated land north of the landfill could easily account for the high value of the upstream sample in Richland Creek. One can imagine a number of explanations for B23 being more than ten times higher than the later soil samples—a good possibility being that at one time the landfill operator sold waste Inerteen to the farmer to oil the road and carry-over contaminated the field next to the road.

The most disturbing aspect of the leaching from this landfill is that the gully runs directly through a farm where animals (pigs and cattle) are being raised. Several years ago, the farmer brought suit against the landfill operator claiming that materials leaching from the landfill were interfering with the reproduction of his cattle. He claimed that his cows

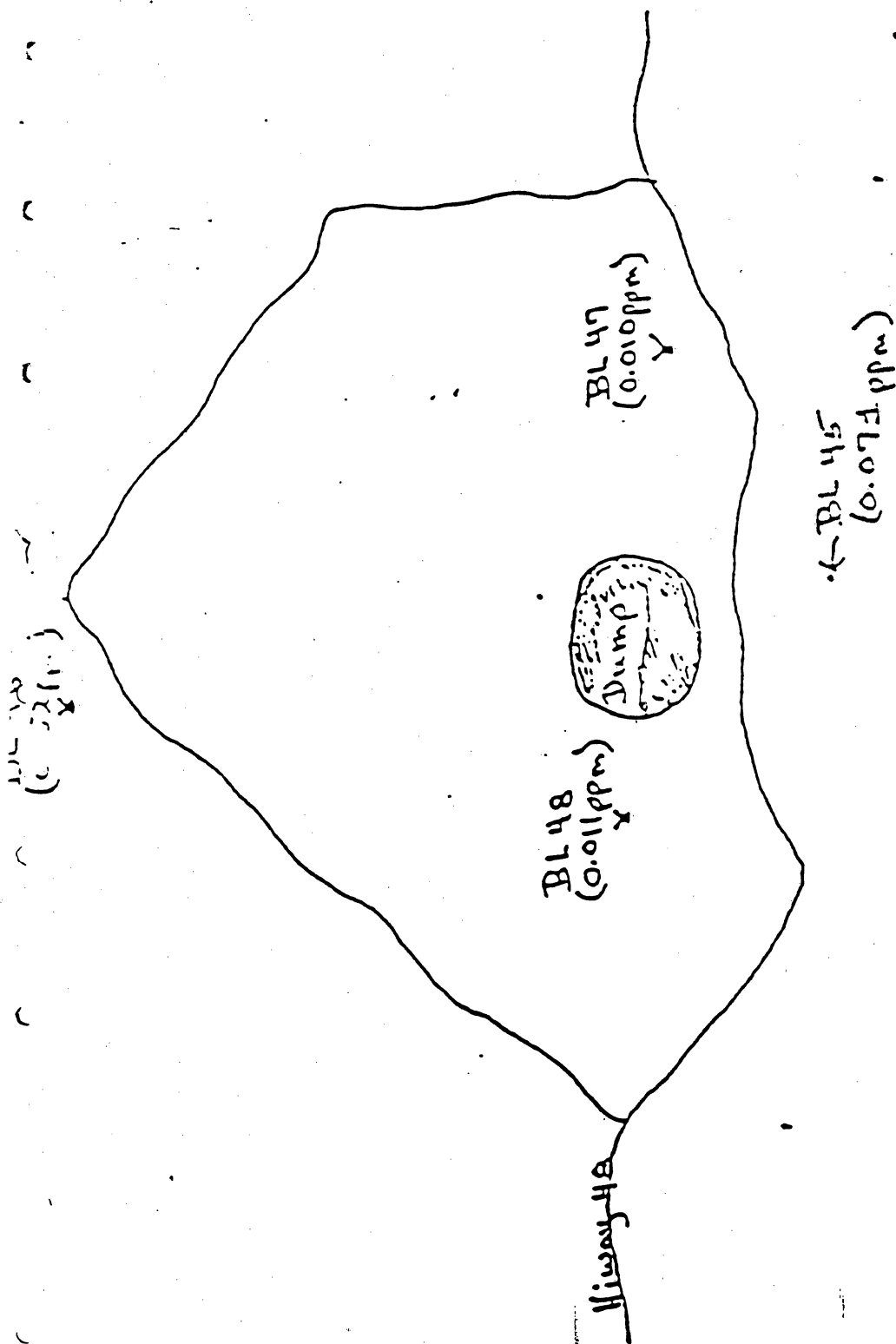


Fig. 3 Aerial Fallout from Landfill No. 1

were having fewer calves and that the calves were smaller and less vigorous. The state of Indiana analyzed leachates from the landfill but did not find anything to support the charge (they probably did not look for PCB's). Whether or not PCB's could be causing the farmer's problem is difficult to say without actually sampling his animals, but experiments with laboratory animals have shown that PCB's do interfere with reproduction in the manner described above.

The leaching from this landfill could easily be getting into the human food-chain. Clearly in the case of the farm just below the landfill, PCB's could be contaminating the pigs and cattle. In addition, Richland Creek meanders through many farms where cattle undoubtedly drink from it. Dairy cattle exposed to very low levels of PCB's will produce milk with levels several thousand-fold increased over the amount ingested (contamination of milk is particularly serious because of the very large quantities ingested by small children, and the possibility that the milk ingested may come from the same contaminated source over long periods of time).

## 2.2 Sanitary Landfill Number 2.

During the approximate period 1968-1972 disposing of liquid Inerteen waste in sanitary landfill number 1 was discontinued and a new landfill (operated by a different independent contractor) was started for disposal of Inerteen contaminated solid waste only. This landfill is located about 20 miles northwest of the plant in a rather remote area.

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The data in Figure 4 show that Inerteen #14 leaching from

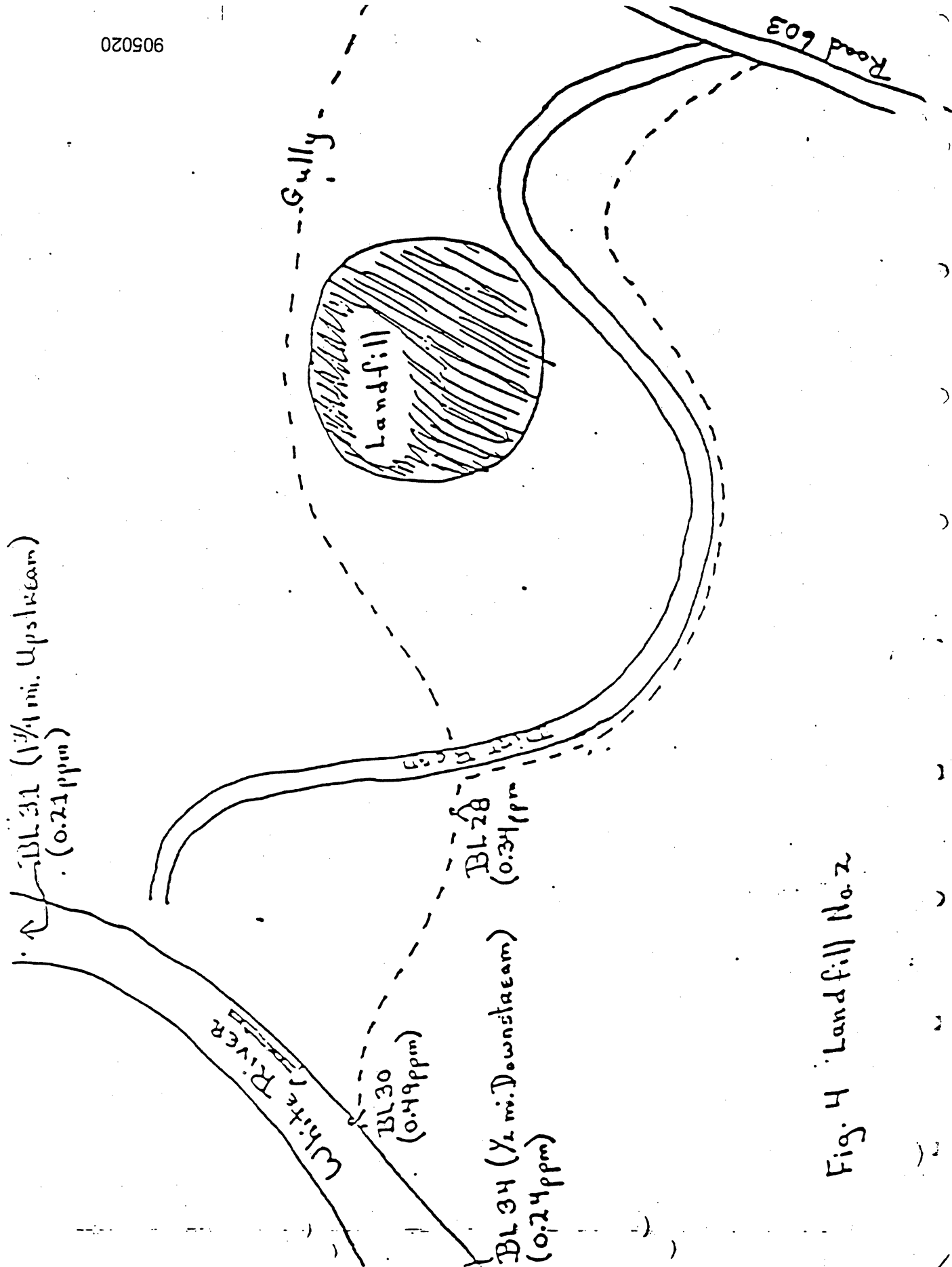


Fig. 4 Landfill No. 2

( this landfill also. B30 was taken from a pile of spoil which had washed down the gully and into the edge of the White River. When one compares the upstream sample on the White River (B31, .21 ppm) with the downstream sample (B34, .24 ppm) it becomes clear that, although material is leaching from the landfill, the river is already pretty well contaminated before it passes by the landfill area (as will be discussed later, however, the material could be emanating from the Westinghouse plant).

( At first analysis, the data presented here seemed to clearly indicate that Inerteen contaminated solid waste could not be contained in sanitary landfill as had been asserted by the Monsanto Chemical Company. This landfill appeared to be an ideal test site (unintentionally of course): the landfill seemed well attended, it reportedly had received only Inerteen contaminated solid waste, and it was bounded by gullies sloping down toward a common junction. As it turned out, however, the case was not so simple. The landfill operator was removing capacitor cans from the plant which had not been emptied, and apparently the landfill was only properly covered-over when somebody had arranged to come out for an inspection. The conditions were bad enough that a game warden complained about the oily materials getting into the river from the landfill. Obviously, the data do not accurately reflect upon disposal of Inerteen contaminated solid waste in a sanitary landfill.

### 2.3 Sanitary Landfill Number 3.

During 1972 a third landfill site was used for disposal of solid waste contaminated with Inerteen. Prior to using the



site, baseline samples were taken around the area for PCB analysis. These samples all showed traces of very "weathered" PCB residues in the .010-.015 ppm range--typical of areas throughout the country which have only received PCB's from atmospheric fallout.

### 3. Movement of Inerteen from the Plant.

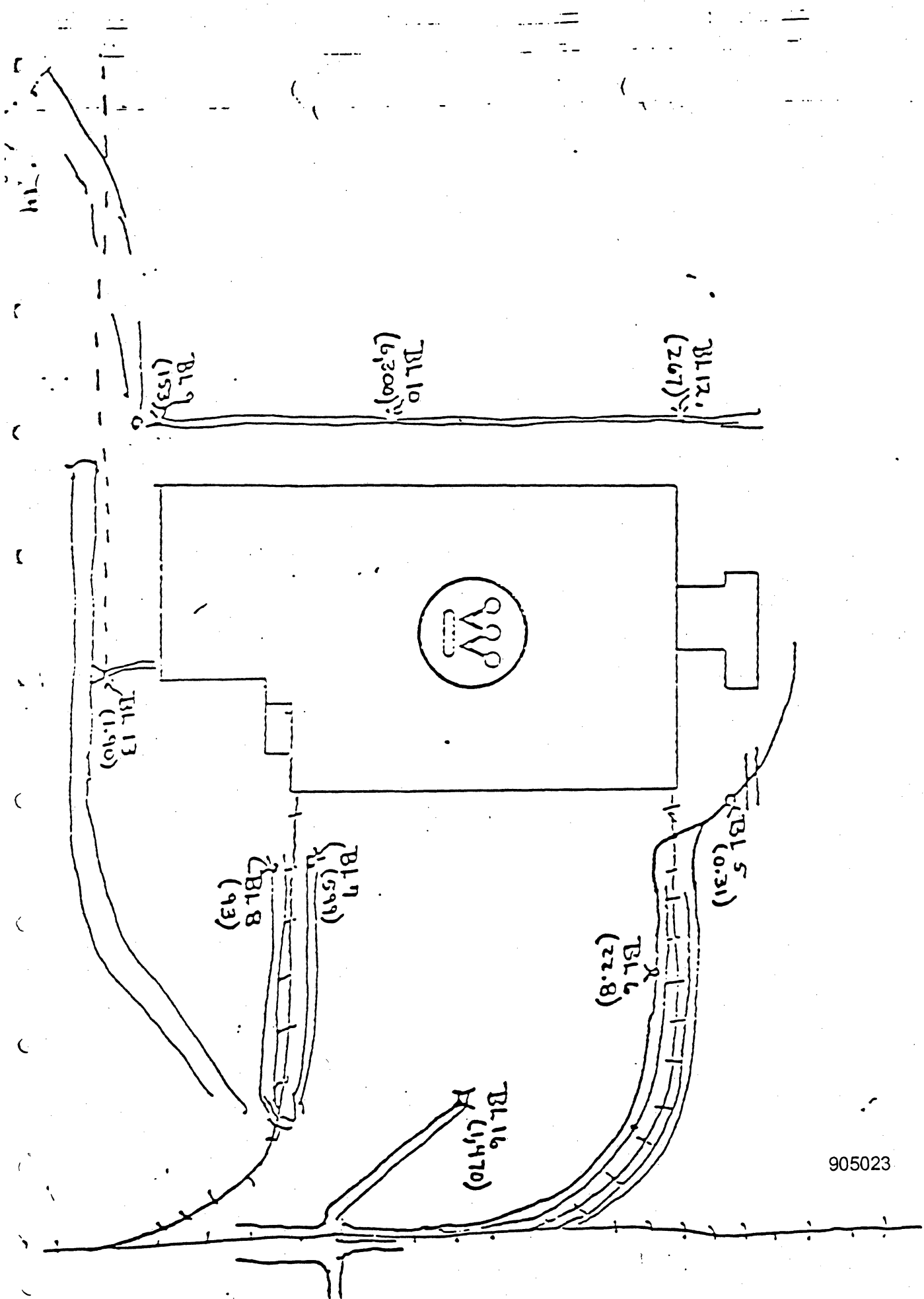
At the time of sampling the most likely area for movement from the plant appeared to be from the north side of the building where the tank cars delivered the material. All of the drainage from the plant grounds seemed to move northward toward Stout Creek.

The data presented in Figure 5 show the Inerteen levels around the plant. As was expected, all samples contained Inerteen and the area where the tank car comes in is quite high. The B16 sample seemed higher than would be expected if this culvert receives drainages only from the other ditches around the plant.

The most surprising samples were those at the south side of the building—B10 at 6,300 ppm is 20-fold higher than the highest sediment sample which we had analyzed prior to this program. The material from the south side of the building appears to move southward into a small gully.

Figure 6 shows samples taken off the plant grounds in the drainage leading to Stout Creek. Obviously a considerable amount of Inerteen leaves the plant grounds and moves into Stout Creek. B22 shows 23.1 ppm in Stout Creek, more than two miles from the plant.

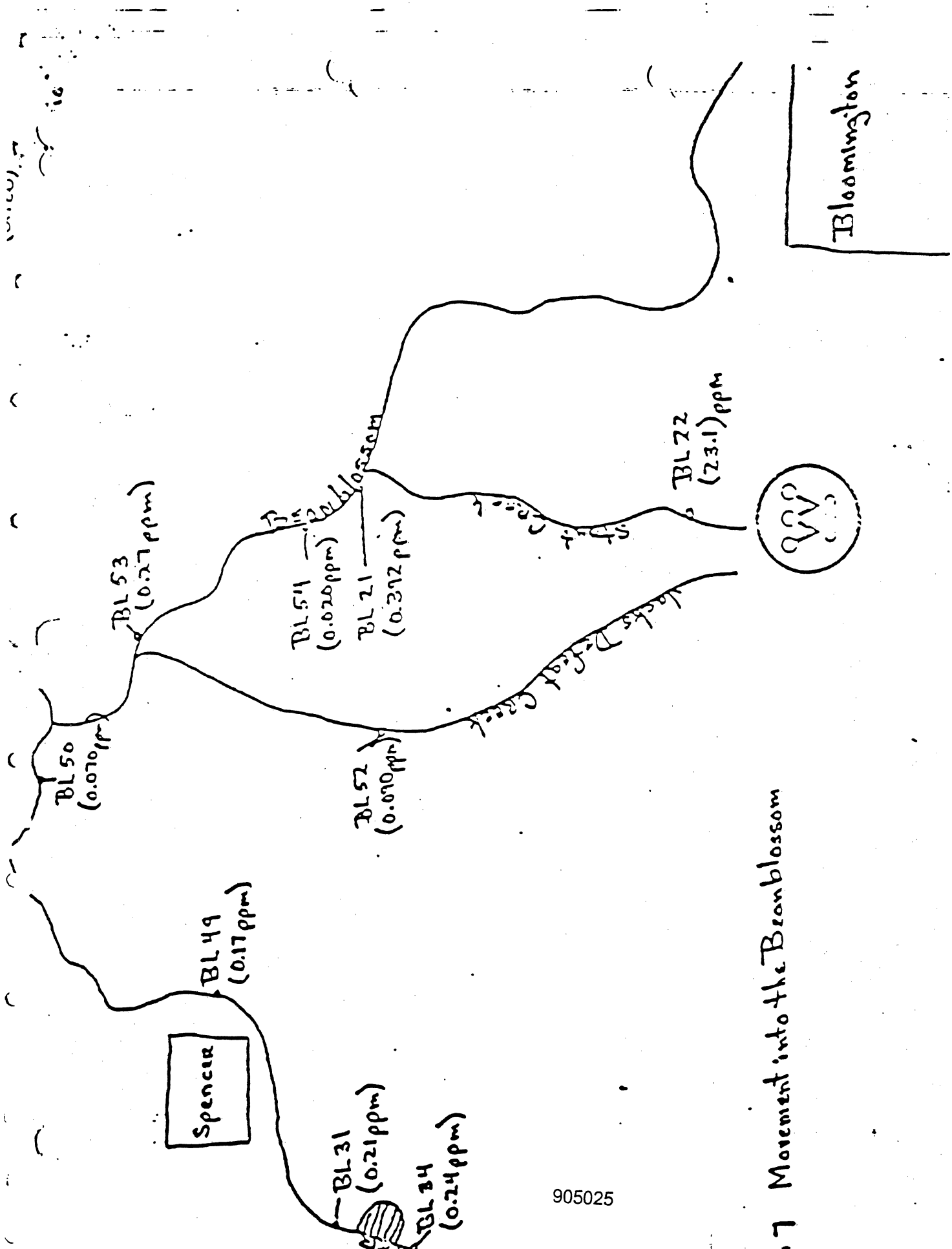
Figure 7 shows movement of the Inerteen into the Beanblossom Creek and on into the White River. A fish sample at the junction of



905023

Topographic map of the Stouffville area. The map shows contour lines, a grid, and labels for 'Stouffville Creek' and 'Stouffville'. A dashed line indicates a proposed or historical path. The map is oriented with North at the top.

905024



905025

7 Movement into the Beamblossom

Stout Creek and Beamblossom Creek showed 5.0 ppm PCB, mostly of the Inerteen formulation (the FDA limit for human consumption in fish is 5.0 ppm).

The samples on the White River indicate that considerable PCB material is being brought down river from some unknown source which cannot be from Westinghouse operations. It is not possible to determine magnitude of the contribution from Westinghouse compared to the amount from the unknown without undertaking a detailed water monitoring program.

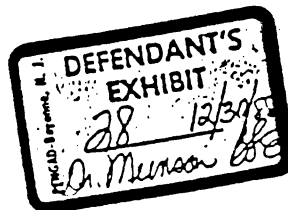
Three fish samples taken from a commercial fisherman downstream on the White River (near the Worthington Bridge) indicate that fish from this portion of the river exceed FDA limit for human consumption of 5.0 ppm. Table 1 below presents these data.

Table 1

|         | <u>1242 ppm</u> | <u>1254 ppm</u> | <u>Total PCB</u> |
|---------|-----------------|-----------------|------------------|
| Fish 8  | 2.9             | 1.4             | 4.3              |
| Fish 9  | 7.1             | 1.5             | 8.6              |
| Fish 10 | 4.5             | 2.7             | 7.2              |

These fish are very definitely transmitting PCB's to humans because we bought dressed filets prepared for cooking. It would be very difficult to pinpoint the sources of the material in the fish, but discovery of these high levels by a regulatory agency could lead to an investigation which would almost certainly discover the leakage of material to the environment from the Bloomington plant.

26



T. O. Munson  
December 13, 1972

SUMMARY OF FOLLOW-UP SAMPLING AT BLOOMINGTON

Two points were to be covered:

1. Could PCB material be coming down from Indianapolis?
2. To what extent had the material entering Clear Creek from the sewage treatment Plants contaminated the East Fork of the White River.

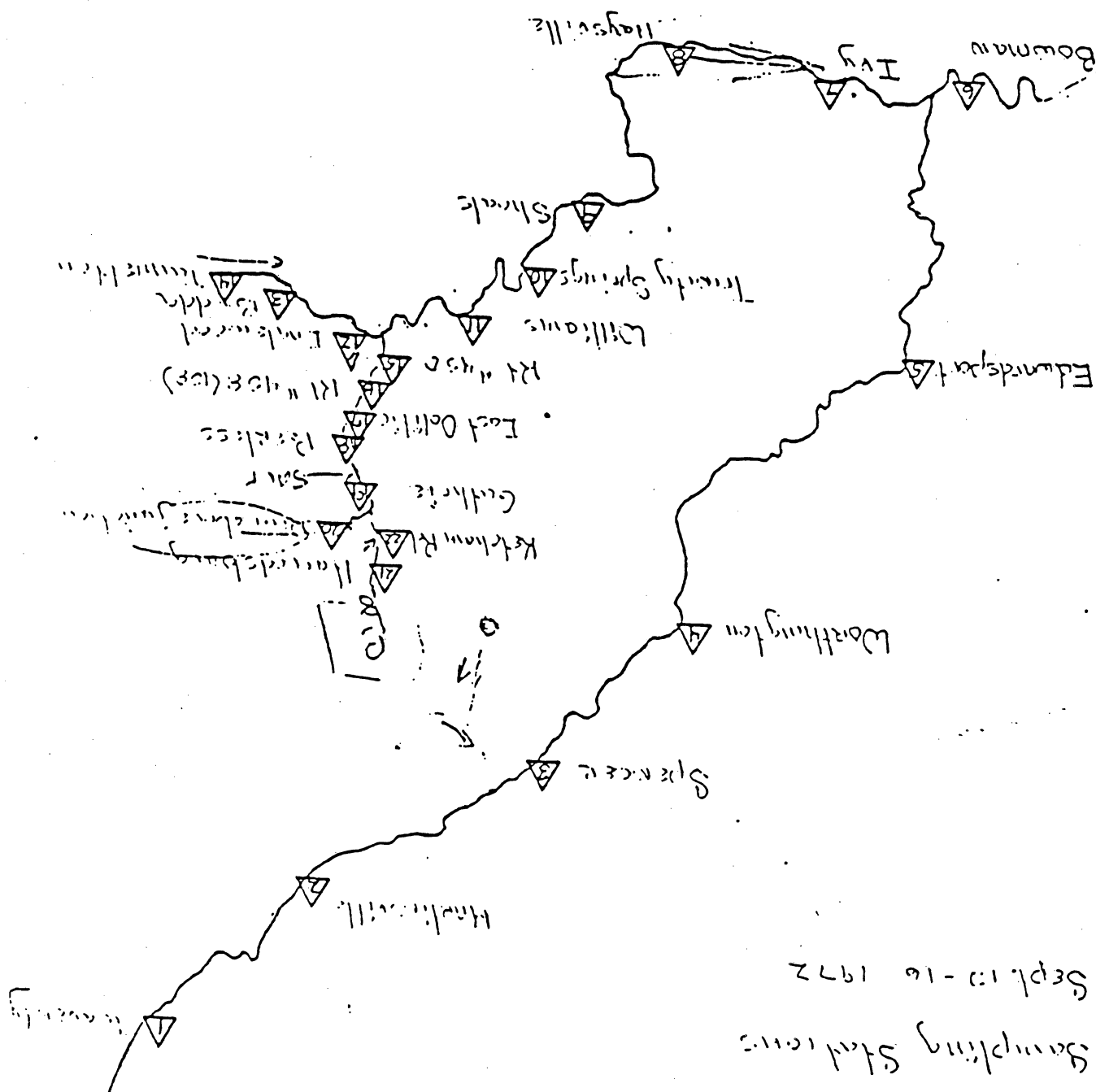
Time has not yet permitted preparation of a final report on the subject but general observations can be made,

Sufficient PCB's are coming down the White River from Indianapolis to obscure inputs from our plant via Bean Blossom Creek. The sediment at Waverly was two to three times higher than downstream, and the sunfish contained PCB's as high as sunfish taken downstream.

As was suggested by the earlier study, residues in biota and sediments of Clear Creek are quite high--a sunfish at the head of the creek showing 58 ppm. The samples from Tunnelton (St. 14) show that the East Fork of the White River is quite low in PCB's upstream from where Clear Creek dumps in. In general, the resident fish in the Clear Creek--East Fork of the White River system are higher than the limit for human consumption of five ppm but below Haysville, where the river widens, the levels drop below five ppm.

# Shapla for Shapla

| Stk # | Type                 | Station |                 | Stk # | Type     | Station |
|-------|----------------------|---------|-----------------|-------|----------|---------|
| 13    | Sediment             | 1       | 1243 .261 ppm   | 191   | Sediment | 21      |
| 15    | Sediment             | 3       | 1248 .221 ppm   | 200   | Shapla   |         |
| 13    | Sediment             | 6       | 1248 .048       | 201   | Shapla   |         |
| 30    | Sediment             | 9       | 1248 .042       | 202   | Shapla   |         |
| 35    | Sediment             | 15      | 1248 2.51       |       |          |         |
| 37    | Sediment             | 19      |                 |       |          |         |
| 4     | Crayfish             | 2       | 1254 .214       |       |          |         |
| 1     | (1) Longsail Sunfish | 2       | 1254 1.03       |       |          |         |
| 16    | Crayfish (3)         | 3       | 1254 .072       |       |          |         |
|       | Sunfish (5)          | 3       | 1254 .126       |       |          |         |
| 10    | Sunfish (1)          | 4       | 1248 .475       |       |          |         |
| 5     | Catfish (2)          | 5       | 1242 1.23       |       |          |         |
|       | Sunfish (1)          | 5       | 1242 1.05       |       |          |         |
| 8     | Sunfish (1)          | 6       | 1245 .213       |       |          |         |
|       | Sm Mouth Bass (2)    | 8       | 1243 .716       |       |          |         |
|       | Shad (1)             | 8       | 1242 3.39       |       |          |         |
| 6     | Catfish (1)          | 9       | 1248 .116       |       |          |         |
| 8     | Sm Mouth Bass (2)    | 9       | 1242 7.73       |       |          |         |
| 10    | Sunfish (2)          | 11      | 1248 17.5       |       |          |         |
| 1     | Blue gill (3)        | 11      | 1242 5.95       |       |          |         |
| 0     | Rayon (Claw) (2)     | 14      | Trace // 20 gph |       |          |         |
|       | Sunfish (3)          | 14      | Trace           |       |          |         |
|       | Crayfish (3)         | 15      | 1242 4.25       |       |          |         |
| 3     | Crayfish (1)         | 15      | 1243 13.1       |       |          |         |
|       | Crayfish (1)         | 21      | 1242 35         |       |          |         |



Sampling Stations  
Sept. 10 - 16 1972

Worthington



2966

20



*st  
Hurry  
ill see you  
after returning  
from China*

EAST PITTSBURGH WORKS, 2-G-46

From: Bloomington Works F  
Wh: 522-4273  
Date: October 18, 1972  
Subject: Your Letter, 10-6-72

Dr. H. Wilbur Soelcher  
Headquarters Industrial Hygiene

cc: Mr. J. Kirk, Law Department, East Pittsburgh W Bldg. 1706  
Mr. E. Kerns, Headquarters Works Engineering, East Pittsburgh W Bldg. 150  
Mr. E. Boquist, Headquarters Engineering Product Improvement, R&D Center  
Mr. A. Maxin, Safety Supervisor, Bloomington Works  
Mr. J. Brittain, Engineering Manager, Bloomington Works

A. Nameplate Precautionary Statement

1. The subject of an appropriate statement to be carried on capacitor nameplates, with regard to polychlorinated biphenyl content, has attracted considerable and diverse attention in recent months:

- a) The original nameplate statement is shown on Exhibit 1.
- b) In a communication from Mr. Boquist, 4-6-72, Mr. Kirk's desired wording was stated (Exhibit 2).
- c) As indicated on Exhibit 2, a reduction in verbiage was requested and approved, resulting in a second nameplate wording, Exhibit 3.

2. Throughout the considerations listed above, the principle idea was to provide warning to users of capacitors that proper disposal of defective or retired capacitors should be made in order that losses of PCB to the environment be minimal. As indicated in your letter, possible OSHA requirements probably were not adequately accommodated.

3. The problem of proper labelling of capacitors is not peculiar to, nor limited to, Westinghouse alone. Attached (Exhibit 4) is a letter from a General Electric representative on this subject, together with a copy of the proposed NEPA Joint Sections on Warning Labels Guidelines (Exhibit 5). Likewise, ANSI, ANSI C-107 has wrestled with this problem as shown in Section 2, Paragraph VI (Exhibit 6).

4. Considerable time and expense goes into each subsequent change in wording. For that reason, I am requesting that the need for the indicated change be verified in light of the comments above. I am also asking that the recommended change be re-considered for possible reduction in wordage consistent with the purposes that can be served.

905030

Dr. H. Wilbur Speilcher  
Page 2  
October 18, 1972

B. Capacitor Unit Instructions as now contained on IS 39-411-1 (supplied with equipment instruction books) and on IT 39-411-1 which duplicates the information from IS 39-411-1 (and is supplied as a tag with each capacitor unit shipped separately, in a carton). (See Exhibit 7).

1. The caution statement recommended may be added to the next revision of the Instruction Sheet and Instruction Tag.

2. There is some reservation to use of the disposal statement, however, based on practical considerations:

- a) It has not been regarded as practical to recommend that users remove fluid from individual capacitors for return to Monsanto for incineration. (This is not true for transformers, which are much larger devices and which have PCB in "free" liquid as a major constituent.)
- b) DAD has not adopted the commercial policy of recommending return of defective apparatus to Chem-Trol for disposal on the basis that their somewhat limited facilities could be swamped by a sudden influx of large shipments from users throughout the country.

3. The problem of disposal of apparatus currently being retired after 20 years to 30 years of service is a large and real problem, not yet resolved by the industry. It must be faced by all the utility and industrial users, as well as by the suppliers. Disposal services listed in ANSI C-107 do not appear to be sufficient for the task, at this moment (Exhibit 8). ANSI C-107 recommended procedures for disposal (Exhibit 9) are being followed by some users, but have not been tested nor approved by the multitude of potential jurisdictional agencies at federal, state, and local levels. Under these conditions, the desirability of any statement beyond giving notice of the problem to the user, seems questionable.



Robert D. McClain, Manager  
Capacitor Unit Engineering

RDMcC:kc

905031

WESTINGHOUSE PROPRIETARY

STATUS OF POLYCHLORINATED BIPHENYLS 4/6/72

Activities in several areas are worthy of reporting since the last report.

- (1) In-house controls to minimize or eliminate plant effluents:
  - (a) South Boston - analysis of samples indicated there is a leakage of PCB's from the plant (See ref #18 for further details)
  - (b) Other plants - still a need to complete analysis of samples at Bloomington, Sharon, East Pittsburgh and to take samples of Phoenix, Cleveland, and Vicksburg. Dr. T. Munson who had requested 24 man months funding for PCB effort (ref #14) has only received 2 man months to date. Immediate corporate or divisional funding is needed to support this vital effort.
  - (c) A rough draft of a corporate "Policy for Use and Handling of Inerteen" is in work using division procedures and a meeting to finalize same will be held on April 7.

- (2) In use controls to minimize adverse effects on customer's environment:

- (a) A review of present product warnings was made with J. Kirk, Westinghouse legal department and the legal department feels that the following was the best used by divisions and should be used by all divisions in the future.

"THIS PRODUCT CONTAINS POLYCHLORINATED BIPHENYLS, EXTREME CARE SHOULD BE TAKEN TO PREVENT ANY ENTRY INTO THE ENVIRONMENT, THROUGH SPILLS, LEAKAGE, USE, DISPOSAL, VAPORIZATION OR OTHERWISE, REFER TO WESTINGHOUSE INSTRUCTION BOOK FOR INFORMATION ON USE, HANDLING, AND DISPOSAL PROCEDURES"

This is a slight modification to an existing warning plate  
# 2070A00101.

WESTINGHOUSE PROPRIETARY

905032

100

25

THIS PRODUCT CONTAINS POLYCHLORINATED BIPHENYLS.  
EXTREME CARE SHOULD BE TAKEN TO PREVENT ANY  
ENTRY INTO THE ENVIRONMENT. REFER TO WESTINGHOUSE  
INSTRUCTION BOOK FOR INFORMATION ON USE, HANDLING,  
AND DISPOSAL PROCEDURES.

○

5-25-72.

2.11" COUNTERELETTERS OF PROSECUTION AND DEFENSE.

[illegible]

המחברות הן "המחברות" ו"המחברות"

12507 40.5.50.11.

## APPROVAL

## תעמולה וזיוף

Line 1-002

Westinghouse 275-1

INERTER™ CAPACITOR

CAUTION

THIS PRODUCT CONTAINS NO TOXIC OR FLAMMABLE MATERIALS.  
IT IS A HIGH VOLTAGE DEVICE AND SHOULD BE HANDLED WITH CARE.  
DO NOT TOUCH THE TERMINALS OR THE CAPACITOR SURFACE.  
IF YOU DO, YOU MAY BE SHOCKED OR BURNED.  
IF YOU ARE SHOCKED OR BURNED, GET MEDICAL HELP IMMEDIATELY.  
DO NOT USE THIS PRODUCT IF IT IS DAMAGED OR DEFECTIVE.

*Original*  
*has been seen*  
*Exhibit 1*

*Exhibit 1*

1       essentially requesting permission to do outside  
2       consulting.

3   Q    Requesting that of the EPA?

4   A    Yes.

5   Q    This letter was written to the EPA?

6   A    Yes.

7   Q    And sent to them; is that right?

8   A    Yes, to Christopher Seglem, regional counsel.

9   Q    So, as of June 11, 1976 you had indicated to Mr. Seglem  
10       that --

11                   MR. McCREA: The letter speaks for itself.

12   Q    -- that Westinghouse had performed an environmental  
13       survey of PCB leakage from the plant, from the  
14       Bloomington plant; is that right?

15   A    Yes. I state in there that I had performed such a  
16       survey.

17   Q    Now, we've just marked your Deposition Exhibit No. 28.  
18       Can you identify this three-page document for us?

19   A    It appears to be a follow-up report written by myself  
20       having to do with samples taken around Bloomington.

21   Q    Do you have any recollection of drafting this  
22       three-page document?

905035

23   A    Vaguely. I remembered there was more fish data than

1 the data which I had seen up to this point.

2 Q When you say that sufficient PCBs are coming down the  
3 White River from Indianapolis to obscure inputs from  
4 our plant via Beanblossom Creek, what was the context  
5 of that statement?

6 Why was that made?

7 A One of the things I was trying to do was alert the  
8 people at Bloomington to the fact that the levels of  
9 PCBs which could be associated to the Westinghouse  
10 plant were high enough that they were easily  
11 discoverable. Now, in that vein I'm saying that the  
12 inputs to the White River from Westinghouse via the  
13 Beanblossom Creek would be somewhat obscured by the  
14 presence of PCBs coming downstream from Indianapolis.

15 Q All right. Let's go to page 3 of Exhibit 28. At the  
16 top is Waverly; is that right?

17 A Yes.

18 Q All right. If you keep going upwards, is that where  
19 you get to Indianapolis?

20 A I believe so.

21 Q And Bloomington doesn't seem to appear on this map.  
22 does it?

905036

23 A I believe it's in that square box with a B in the

1 middle of it just above sample 21.

2 Q I see. Are you aware of any other sources of PCBs  
3 other than Westinghouse downstream from the  
4 Westinghouse plant at Clear Creek?

5 A No, I don't think so.

6 Q If there is a plant in Bedford, a GM foundry in  
7 Bedford, at around the sample point 20 that had been  
8 found to have discharged levels of PCBs, would that  
9 change your opinion at all as to the relative  
10 contribution of the Westinghouse plant to levels found  
11 in Clear Creek?

12 MR. McCREA: Are you suggesting that 20 is  
13 where the White River is located?

14 Bedford is on the White River, not Clear Creek.

15 Q Well, let's redo the question. If there is a GM  
16 foundry at or around point 20 that had levels of PCBs  
17 discharged from it, could that account for levels below  
18 that point of PCBs?

19 A If they were discharging into the stream, they  
20 certainly would be contributing to levels downstream.

21 Q And was your conclusion that the contributions from  
22 Indianapolis into the White River could account for the  
23 levels found in the White River?



1 A I think so. It seemed to me that the White River was  
2 carrying PCBs with it from up toward Indianapolis. So,  
3 upstream of where the Westinghouse inputs would go in  
4 it would seem that there were other sources.

5 Q Can you answer the question No. 2 based on the  
6 information that you developed in Exhibit 28?

7 A Well, if one assumes that there were no other sources  
8 than the sewage treatment plant, the data they give is  
9 indication of the level of contamination downstream.

10 Q Where is the sewage treatment plant on this map?

11 Is that the B, the box with a B in it?

12 A Yes, right in there.

13 Q Is that your understanding?

14 A Yes. It's been 16 years since I've seen this thing.

15 Q Doctor, you took some fish samples at Haysville at  
16 station 8; is that right?

17 A Yes.

18 Q And then you took some other samples below Haysville  
19 also of fish; is that right?

20 A I don't see fish from station 7.

21 Q I don't either. I'm just referring to your statement  
22 at the bottom of the first page.

905038

23 MR. McCREA: Do you have a copy which has

1 the right-hand column at the top of the --

2 MR. FELDMAN: That's more legible, no.

3 A The sample No. 8 possibly station 8, that may possibly  
4 be below. There is a small mouth bass and a shad both  
5 below 5 PPM.

6 Q I don't see the resident fish at 5 parts per million  
7 that you are referring to in that last sentence on the  
8 first page.

9 A Where I say in general the resident fish are higher  
10 than the limit for human consumption?

11 Q Right.

12 A Okay. Well, if you look at samples that are labeled  
13 station 9, there's a small mouth bass at 7.73 parts per  
14 million.

15 Q There's also a catfish at .116.

16 A True. Then on station 11 there's two sunfish I think  
17 that is at 17.8, blue gill at 5.95. I'm assuming  
18 that's what I'm referring to in that last sentence.  
19 And that the fish at station 8 -- that station 8 is  
20 below Haysville.

905039

21 Q But when you say that generally the resident fish are  
22 higher than the limit of 5 parts per million you got  
23 three fish that are higher but many more that are quite

1 a bit lower, don't you?

2 A Many more?

3 Q Well, I mean significantly more that are under 5 parts  
4 per million than above it; isn't that true?

5 A Well, station 9, 11, 15. 15 is at 4.25, if I can read  
6 that right. Oh, I'm sorry. That's a crayfish. That's  
7 not a fish. Okay. So, basically I guess I'm looking  
8 at the two sets of fish at station 11, one is at 5.95,  
9 one is at 17.8, a small mouth bass at station 9 at 7.73  
10 and then the only other fish listed there in that area  
11 is the catfish at .116.

12 Q And sediment is .042 above that at station 9 further  
13 up?

14 A Yes, that's a sediment sample.

15 Q By the time it gets to Haysville it's quite low, isn't  
16 it, 3.39 and .716?

17 A What are you referring to? The fish or the sediment?

18 Q The small mouth bass and the shad.

19 A At?

20 Q Station 8.

21 A 8. Well, 3.39 and .716, I wouldn't call that quite  
22 low. It's below the 5 parts per million.

23 Q Doctor, did the Bloomington plant use 1248?

1 A I don't think so. But as the 1242 formulation, the  
2 Inerteen formulation, weathers in the environment it  
3 then is best quantitated as 1248 because the pattern of  
4 the peaks shifts as the material biodegrades.

5 Q Does it biodegrade if it's in a fish?

6 A It probably biodegraded before it got to the fish.

7 Q There is a dam at the Williams station, is there not?

8 A I don't know.

9 Q If there were a dam at the Williams station, would that  
10 have any effect on PCB values below that point?

11 A Could. It depends upon what's happening and how the  
12 material is being transported.

13 Q Did you do samples of sheep, sheep parts?

14 A That rings a faint bell, but I can't think in what  
15 connection.

16 Q Is that your answer?

17 You sounded like you were going to say something  
18 else. We're all waiting breathlessly.

19 A Yes. Unfortunately the gray cells have failed me.  
20 Vaguely I recall something having to do with sheep, but  
21 I can't remember what it was.

905041

22 Q Doctor, in Exhibit 15 which was marked at your first  
23 session, for the record that's Plaintiff's Answers to

1 Westinghouse Electric Corporation Supplemental  
2 Interrogatories Concerning Expert Testimony, the  
3 plaintiffs indicate that you will testify that you  
4 informed personnel at the Bloomington plant that  
5 precautions were necessary to prevent the further  
6 escape of PCBs from the Bloomington plant. Dr. Munson  
7 will testify that his recommendations were not acted  
8 upon because of the costs involved.

9 You don't really know, do you, whether your  
10 recommendations were acted upon after you left  
11 Bloomington?

12 A I guess I just know what I was told, that they wouldn't  
13 be. Now, whether they were or not, I don't know.

14 Q You don't know that your recommendations were not acted  
15 on and you really don't know what was done at the plant  
16 after you left to reduce discharge to the environment,  
17 do you?

18 MR. McCREA: He's answered it yes.

19 A Right. Of my own knowledge, I don't know. True.

20 Q Well, you say of your own knowledge. Has someone  
21 informed you of that other than me since you left the  
22 Bloomington area in 1972?

905042

23 A Mr. McCrea has told me various things about what took

1 place at the plant.

2 Q What did Mr. McCrea tell you about what took place at  
3 the plant?

4 A That liquid wastes were put down the sewer.

5 Q Did he tell you anything else?

6 A On this particular topic he told me the drains were  
7 welded shut at one point. There was an employee who  
8 was instructed to come in in the middle of the night  
9 and pour liquids down the drain. That's all I can  
10 remember on this particular topic.

11 Q Did he tell you who the employee was who was instructed  
12 to come in in the middle of the night and pour  
13 materials down the drain?

14 A If he did, I don't remember his name.

15 Q Did he provide any other details concerning  
16 Westinghouse's pouring of Inerteen down the drain at  
17 the plant?

18 A I don't think so.

19 Q Did he provide you with any information concerning  
20 other measures other than sealing the drain to reduce  
21 the discharge of PCBs into the environment?

22 A I don't remember any.

23 MR. FELDMAN: Let's take a real short

905043

1 break.

2 (A recess was taken.)

3 Q Doctor, in the disclosure of your opinion, sir, likely  
4 testimony, the document indicates that you will testify  
5 that it was unconscionable for Westinghouse not to  
6 communicate the information in his report to Dale and  
7 Connie Conard who had maximum exposure to the PCB  
8 contamination.

9 Is that a correct characterization of your opinion  
10 as you sit here today?

11 A Yes. I think so. They had an opportunity to do it and  
12 should have done it.

13 Q What should Westinghouse, in your opinion, have told  
14 the Conards in 1972?

15 A Well, at that point or later they should have told them  
16 about the movement of PCBs away from the landfill onto  
17 their property.

18 Q What would that information have meant to Dale and  
19 Connie Conard in 1972?

20 A How do I know.

21 Q The answer is you don't know, do you?

22 A No, I don't know. But I do believe they had a right to  
23 know that.

1 charge?

2 A. Yeah. It is an electrical charge. It can be  
3 viewed the same way.

4 Q. Dr. Munson, when you were in Bloomington, did  
5 you go to an area known as Twin Lakes with a  
6 representative of Westinghouse? (We drove by  
7 Twin Lakes this morning.) Were comments made  
8 by the representative with respect to the  
9 killing of weeds in one of the lakes? And, if  
10 so, can you tell us what you recall?

11 A. Yes. I recall driving down a hard surfaced  
12 road. We were chatting about one thing and  
13 another. I don't remember who this person  
14 was. I don't believe it was Lou Shove, but I  
15 can't remember which one of the other people  
16 it would have been. He was telling me about  
17 some years earlier they had done an experi-  
18 ment. They apparently had a continual weed  
19 problem in these lakes, and they did an ex-  
20 periment to see if P.C.B.s could be used to  
21 control the weeds in the lake. My understand-  
22 ing was that they put many gallons -- I would  
23 think hundreds of gallons -- of P.C.B.s in the  
24 lake. I'm not sure whether they sprayed it or  
25 how they did it. But, I hadn't recalled the

905045



1 name of the lake, but I had a very vivid  
2 memory, in my mind. As we drove down the  
3 road, in talking about it and looking to the  
4 right and seeing this long, oblong of water  
5 that we could see and then gesturing back to  
6 the left to the other lake, as we turned  
7 around and looked there, that...There are more  
8 bushes and trees in front along the edge of  
9 the road, but that's exactly the shape I had  
10 in my mind, and it seems quite likely that  
11 that was the location.

12 Q. You mentioned earlier that P.C.B.s are not  
13 soluble in water, as is sodium chloride. And  
14 you explained how solubility comes about.  
15 Can you explain to us how P.C.B.s move through  
16 water?

17 A. The one thing we have to be careful about when  
18 we talk about whether something is soluble or  
19 insoluble...It depends upon what criteria  
20 you're using. Generally the way you say that  
21 is that, if you take an amount, like a few  
22 grams of it, and try to dissolve it in a few  
23 liters of water, or -- put it another way -- a  
24 quarter teaspoon and you try to put it in a  
25 quart of water, and you shake it and shake it

905046

Westinghouse Electric Corporation



September 16, 1975

Mr. Stephen R. Wassersug  
Director, Enforcement Division  
Environmental Protection Agency  
Curtis Building  
6th and Walnut Streets  
Philadelphia, Pennsylvania 19106

Re: Request For Information - Polychlorinated  
Biphenyl Compounds or Mixtures

Dear Mr. Wassersug:

In response to the request of the Assistant Administrator for Enforcement, U.S. Environmental Protection Agency, Westinghouse Electric Corporation submits the requested information for Westinghouse facilities which are known to handle polychlorinated biphenyl compounds or mixtures (Attachment A). Due to the lack of sufficient time and because records are not customarily maintained for all of this information there are some facilities for which a complete response cannot be made.

With reference to the above-referenced letter and the questions attached thereto, Westinghouse has the following additional comments:

1. The presence of polychlorinated biphenyl compounds in the environment has been recognized for some period of years and has been a concern to the electrical industry. The industry recognized, that because of the documented need for the continued use of polychlorinated biphenyl compounds in capacitors and transformers to provide the public with safe, reliable, and efficient electrical equipment, unusual protective measures would have to be taken. Westinghouse did not delay in introducing a new capacitor dielectric (Aroclor 1016 from which the higher-chlorinated persistent homologs have been substantially removed), sealing drains in manufacturing areas where PCB's were used, utilizing incineration facilities for scrap material and PCB

905047

Page Two  
September 16, 1975

contained wastes specially designed for the destruction of PCB's or special land fills, and instructing operating personnel and users regarding the need for care and waste disposal (Attachments B and C). Most of these methods were implemented prior to the enactment of the Federal Water Pollution Control Act Amendments of 1972.

2. Any environmental standard or regulation must be developed upon a sound legal and technical basis. The history of the usage of polychlorinated biphenyl compounds reflects that while they were initially used in other applications, the only domestic supplier of polychlorinated biphenyl compounds voluntarily limited their sales to the electrical industry in 1971. Therefore, laboratory and environmental studies should reflect the types of polychlorinated biphenyl compounds used by the electrical industry for setting any effluent standards relating to capacitor and transformer facilities. Furthermore, the results of these studies should be made available to the scientific community and the Science Board for evaluation before they are used as a basis for any regulation.

Very truly yours,

*Roger E. Wills, Jr.*  
Roger E. Wills, Jr.  
Attorney

REW:mlm

Enclosures

905048

POLYCHLORINATED BIPHENYL (PCB) COMPOUNDS OR MIXTURES

- 1.. For each PCB compound or mixture produced or imported by your company, for each company facility, during each year of 1971, 1972, 1973, 1974, and the first two quarters of 1975:
  - a. The total amount of each PCB compound or mixture produced or imported.
  - b. The name and address of each of your company's facilities which handle PCB compounds or mixtures (including production facilities and wholesale and retail outlets), and the amount of each PCB compound or mixture distributed through each facility.
  - c. The name and address of each customer of each PCB compound or mixture, and the amount of each PCB compound or mixture obtained by each customer from each facility.

The entire question is not applicable for all facilities.

2. For each PCB compound or mixture incorporated by your company into its products, for each company facility, during each year of 1971, 1972, 1973, 1974, and the first two quarters of 1975:
  - a. A description of each product.
    1. Sharon - Transformers
    2. South Boston - Transformers
    3. Bloomington - Capacitors
    4. Cleveland - Capacitors
    5. Repair facilities - Transformers
  - b. For each product the total amount incorporated of each PCB compound or mixture. (pounds) (est.)

Deleted

- c. For each product the name and address of each source from which your company obtained each PCB compound or mixture, and the amount of each PCB compound or mixture obtained from each source.

For all products and all facilities the source is

Monsanto Chemical Co.

800 North Lindberg Blvd.

St. Louis, Missouri 63166

Deleted

- d. The name and address of each of your company's facilities which handle such products (including production facilities and wholesale and retail outlets), and the amount of each product distributed through each facility.

1. Westinghouse Electric Corporation  
Power Systems  
Transformer Division  
469 Sharpsville Avenue  
Sharon, Pa. 16146
2. Westinghouse Electric Corporation  
Small Power Transformer Division  
Box 920, Highway 58W  
South Boston, Virginia 24592
3. Westinghouse Electric Corporation  
Distribution Apparatus Division  
Curry Pike  
Bloomington, Ind. 47401
4. Westinghouse Electric Corporation  
Outdoor Lighting Division  
1216 West 58th Street  
Cleveland, Ohio 44102

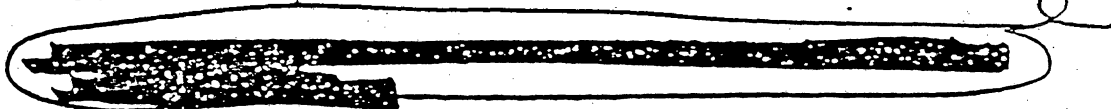
5. Repair Facilities - See Attached Chart

deleted



- e. The name and address of each customer of each product, and the amount of each product obtained by each customer from each facility. For consumer products list only the total production of each product at each facility and the total number of customers. Do not provide the name and address of each customer of consumer products.

deleted



3. For each PCB compound or mixture used by your company in its operations other than for incorporation into its products, for each company facility, during each year of 1971, 1972, 1973, 1974, and the first two quarters of 1975:

- a. A description of each use.

- b. For each use the total amount of each PCB compound or mixture.

Deleted

4. For each PCB compound or mixture reclaimed by your company, for each company facility, during each year of 1971, 1973, 1973, 1974, and the first two quarters of 1975:
- a. The total amount of each PCB compound or mixture reclaimed.
  - b. The name and address of each source from which your company obtained PCB compounds or mixtures, and the amount of each PCB compound or mixture obtained from each source.

The entire question is not applicable for all facilities.

5. For each PCB compound or mixture disposed of by your company (with or without the involvement of other parties), for each company facility, during each year of 1971, 1972, 1973, 1974, and the first two quarters of 1975:
- a. A description of each method of disposal.
  - b. For each method of disposal the total amount of each PCB compound or mixture.
  - c. For each method of disposal, the location of every disposal site, the name and address of each party involved in the disposal of each PCB compound or mixture, and the amount of each PCB compound or mixture disposed of by each party.

#### DEFINITIONS AND SYMBOLS USED FOR THIS SECTION

1. Incineration of liquid wastes by Monsanto, Sauget, Ill., 62201, using approved thermal oxidation, scrubbing and neutralization.
2. Incineration of liquid wastes by Chem-Trol Pollution Services, 1550 Balmer Road, Model City, New York 14107, "using thermal oxidation, scrubbing and neutralization in accordance with New York State and Federal Pollution Control Codes." (See Note to No. 3).
3. "Drummed solids and capacitors shall be disposed of [by Chem-Trol] in an approved scientific landfill in accordance with New York State and Federal Pollution Control Codes. All leachate shall be trapped, tested and treated as necessary prior to release."

NOTE: Contract with Chem-trol provides further that "No other method of disposal shall be used. There shall be no re-sale of any waste or the product of any waste received by Chem-Trol under the terms of this Contract."

4. Neal's Land Fill  
Off Road #603  
Owen County, Indiana
5. Special Designated Section of  
Monroe County Landfill  
Monroe County, Ind. 47401



6. Palos Verdes Land Fill  
26301 S. Crenshaw Blvd.  
Rolling Hills, California  
(Special Area for Disposal  
of PCB Contaminated Wastes)

8. H. Rock Land Fill  
Harvard & East 78 St.  
Cleveland, Ohio

7. Richmond Sanitary Dump  
Richmond, California  
(Special Area for Disposal of  
PCB Contaminated Wastes)

9. Rockside Reclamation, Inc.  
5661 Canal Road  
Cleveland, Ohio

| FACILITY | TYPE       | YEAR |
|----------|------------|------|
| SHARON   | (2) Liquid |      |
|          | (3) Solid  |      |

|              |            |                |
|--------------|------------|----------------|
| SOUTH BOSTON | (2) Liquid | <u>Deleted</u> |
|              | (3) Solid  |                |

|            |        |
|------------|--------|
| WILMINGTON | Liquid |
|            | Solid  |

|           |        |
|-----------|--------|
| CLEVELAND | Liquid |
|           | Solid  |

REPAIR FACILITIES

6. The composition of each PCB compound or mixture produced, imported, sold, reclaimed, used, and/or disposed of by your company since January 1, 1971

Deleted

7. The results of any and all sampling and analysis performed by your company, its agents or contractors since January 1, 1971, concerning the following:

- a. Concentrations of PCB compounds or mixtures in the effluent of any discharges by the company (into waters of the United States or Publicly Owned Treatment Works) or in the emissions of the company into the air.
- b. The flow and/or composition of any discharges or emissions by the company (into waters of the United States or Publicly Owned Treatment Works, or into the air) which contain PCB compounds or mixtures.
- c. Concentrations of PCB compounds or mixtures in receiving waters (both upstream and downstream) of any discharges by the company which contain PCB compounds or mixtures and concentrations of PCB compounds or mixtures in the air in the area of the company.

PCB ANALYSES

| <u>Sample Date</u> | <u>Sample Location</u><br>1974             | <u>Results</u><br>(PPE) |
|--------------------|--------------------------------------------|-------------------------|
| 2/13               | Westinghouse<br>Sharon -<br>R-Building     | 5.7 (1254)              |
| 2/21               |                                            | 4.1 (1260)              |
| 4/16               |                                            | 6.1 (1260)              |
| 5/17               |                                            | 3.1 (1260)              |
| 6/18               |                                            | 8.0 (1260)              |
| 7/17               |                                            | 2.4 (1260)              |
| 7/30               |                                            | 7.2 (1260)              |
| 8/13               |                                            | 12.2 (1260)             |
|                    |                                            | 9.7 (1242)              |
| 8/30               |                                            | 9.0 (1260)              |
| 10/15              | Westinghouse<br><br>Sharon -<br>A-Building | 10.6 (1260)             |
|                    |                                            | 3.3 (1260)              |
| 11/15              |                                            | 4.8 (1242)              |
|                    |                                            | .7 (1260)               |
| 2/13               |                                            | .4 (1242)               |
| 2/21               |                                            | 2.5 (1254)              |
| 4/16               |                                            | 1.7 (1260)              |
| 5/17               |                                            | .4 (1260)               |
| 6/18               |                                            | .3 (1260)               |
| 7/17               |                                            | .5 (1260)               |
| 8/13               |                                            | .4 (1260)               |
|                    |                                            | 1.04 (1260)             |
| 8/30               |                                            | 1.1 (1242)              |
|                    |                                            | .7 (1260)               |
| 10/15              |                                            | .2 (1242)               |
| 11/15              |                                            | .3 (1260)               |
|                    |                                            | .1 (1242)               |
|                    |                                            | .2 (1260)               |
|                    |                                            | .1 (1242)               |

905055

Sample  
Date

Sample  
Date

Results

2/13  
2/21  
4/16  
5/17  
6/18  
7/17  
7/26  
7/30  
7/31  
8/13

Westinghouse  
  
Sharon -  
Power House

40.0 (1252)  
26.6 (1260)  
2.2 (1260)  
1.7 (1260)  
5.0 (1260)  
219.0 (1260)  
1.7 (1260)  
1.7 (1260)  
1.3 (1260)  
1.4 (1260)  
.8 (1242)  
9.0 (1260)  
.1 (1242)  
1.6 (1260)  
5.3 (1242)  
.6 (1260)  
.6 (1242)

8/30  
  
10/15  
  
11/15

Date

South Boston

(PPB)

2/20  
2/27  
3/06  
3/13  
4/23  
5/29  
6/26  
7/31  
8/30  
10/02  
10/31  
11/26  
12/30

33  
180  
48  
345  
790  
133  
135  
106  
42  
54.0  
235  
377  
183

Date

Bloomington

(PPM)

2/26  
  
2/27  
3/01  
3/06  
6/05  
8/12  
10/08  
11/10  
12/12

22.2 (se  
cle  
1.7  
.903  
3.2  
1.8  
2.3  
1.8  
.26  
.43

J 75

|      |              |                  |
|------|--------------|------------------|
| 1/8  | Westinghouse | (ppb)            |
| 2/24 | Sharon -     | 19.1 (1260)      |
| 4/24 | R - Building | 2.81 (1260)      |
| 5/30 |              | 2.1 (1260)       |
| 7/11 |              | (Sampler Inoper) |
| 1/8  | Westinghouse | 3.8 (1260)       |
| 2/24 | Sharon -     | 0.25 (1260)      |
| 4/24 | A-Building   | 5.5 (1260)       |
| 5/30 |              | 0.33 (1260)      |
| 7/11 |              | 0.72 (1260)      |
| 1/8  | Westinghouse | 1.6 (1260)       |
| 2/24 | Sharon -     | 10.97 (1260)     |
| 4/24 | Power House  | 1.9 (1260)       |
| 5/30 |              | 0.98 (1260)      |
| 7/11 |              | 1.75 (1260)      |
| 6/05 | South Boston | 28.6             |
|      | Bloomington  | (PPM)            |
| 1/09 |              | 4.6              |
| 1/09 |              | 3.17             |
| 2/3  |              | .526             |
| 3/1  |              | .964             |
| 4/30 |              | .268             |
| 5/30 |              | 1.93             |

In addition, a sampling program was undertaken in February 1971 at Bloomington which indicated 3-40 ppb in the discharge with a rate of flow of 240-280 gallons/minute.

The daily rate of flow from Sharon is: Power House, 252,000 gallons; A-Building, 378,720 gallons; and R-Building, 504,000 gallons.

The South Boston facility discharges in a batch process with a daily rate of 13,500 gallons.

The flow from Bloomington to the sanitary sewer for the dates sampled are as follows:

| <u>Date</u> | <u>Gal/Day</u>            |
|-------------|---------------------------|
| 2/26/74     | Sewer clogged-Sewage back |
| 2/27/74     | 225,615                   |
| 3/01/74     | 232,463                   |
| 3/06/74     | 232,468                   |
| 6/05/74     | 178,000                   |
| 8/12/74     | 252,582                   |
| 10/08/74    | 186,544                   |
| 11/10/74    | 183,874                   |
| 12/12/74    | 160,734                   |
| 1/09/75     | 189,481                   |
| 1/09/75     | 189,481                   |
| 2/3/74      | 162,069                   |
| 3/1/75      | 134,924                   |
| 4/30/75     | 118,637                   |
| 5/30/75     | 106,177                   |

Receiving waters have been sampled at the following locations with the indicated results:

|             |                                                                                |        |          |
|-------------|--------------------------------------------------------------------------------|--------|----------|
| Sharon      | Shenango River<br>at Bank above<br>Clark Street Bridge                         | 6/6/74 | 0.1 ppb  |
|             | Shenango River at<br>Bank by Clark Street<br>Substation (below dis-<br>charge) | 6/6/74 | 0.1 ppb  |
| Bloomington | Clear Creek<br>(above Sewage Treatment<br>Plant)                               | 1/9/74 | 0.25 ppb |
|             | Clear Creek<br>(below Sewage Treatment<br>Plant)                               | 1/9/75 | 5 ppb    |

8. The methods by which PCB compounds or mixtures are transported to, by, and/or from your company, including:
  - a. A description of each method of transportation, and the form in which PCB compounds or mixtures are transported by each method. Where different methods of transportation are used at different facilities specify which transportation method is used at each facility.

SECTION

*deleted*

To Westinghouse Electric Corporation (purchased material).  
Via bulk tank cars (rail).  
Via truck in 55 gallon drums.

From Westinghouse Electric Corporation (scrap Inerteen).  
Scrap Inerteen Via tank truck. (See question 5.)  
Scrap Inerteen Via truck in 55 gallon drums. (See question 5.)

From Westinghouse Electric Corporation (material shipped IN  
Transformers).  
Shipped Via common motor carrier or rail transport.

From Westinghouse Electric Corporation new material PDS 54201KA  
in 55 gallon drums for field filling of transformers.  
Shipped Via common motor carrier.

Each shipment of new material from Westinghouse Electric  
Corporation has the following instructions and information  
given to the carrier.

INERTEEN

Method of Shipment: Ship via all modes.

Packaging: Pack in leakproof container (see note).

Marking: No marking required (except on water shipment container must be marked): "Liquid Plastics - No Label Required".

Labeling: No label required.

Billing: Bill as "Liquid Plastic NOI" and add the following statement:  
"This product contains polychlorinated diphenyls (PCB's) which some studies have shown may be a persistent environmental contaminant. Prevent any entry into the environment through spills. During shipment avoid spills and leakage into inland waterways and the sea. Keep away from food, animal feedstuffs, and pharmaceuticals. In case of emergency concerning this shipment, call collect 618-271-5835, or Chemtrec 800-424-9300"

Note: Any leakage will result in shipment being refused or stopped in transit. Leakage may cause liability for environmental damage.

SOUTH BOSTON

*Deleted*

Received via bulk tank cars from Monsanto.

Liquid and solid wastes are shipped from South Boston by privately-owned tank trucks and vans of Chem-Trol, Inc.

Shipment of transformers containing PCB's are by common carrier.

BLOOMINGTON

*Deleted*

*Deleted* received via bulk tank cars from Monsanto.

*Deleted* received via 55 gallon drums from common carriers.

Liquid and solid wastes are shipped from Bloomington by privately-owned tank trucks and vans of Chem-Trol, Inc.

Shipment of capacitors containing PCB's are by common carrier.

REPAIR FACILITIES  
(see attached chart)

- b. The names and addresses of all known transportors of PCB compounds or mixtures.

L & N Railroad  
908 Broadway  
Louisville, Kentucky

Transport Motor Express  
3190 East 79 Street  
Cleveland, Ohio 44104

Monsanto Chemical Co.  
800 N. Lindberg Blvd.  
St. Louis, Mo. 63166  
(Plant: Sauget, Ill.)

Anderson  
1511 Lakeside Ave.  
Cleveland, Ohio 44114

Moss Trucking Co.  
Charlotte,  
North Carolina

Chem-Trol, Inc.  
Model City,  
New York 14107

C & H Transport  
Dallas,  
Texas

A & H Truck Line Incorporated  
1111 East Louisiana  
Evansville, IN 47717

9. All occasions (including spills) of which you are aware on which PCB compounds or mixtures have or may have been introduced into the environment. In particular, describe such occasions insofar as they involved PCB compounds or mixtures in their liquid state, as incorporated into closed systems, or as incorporated into open systems. For each occasion, indicate name and address of party involved; dates, time, and location of the discharge or spill; and the amounts involved.

1. March 1972 - Rail tank car (No. ACFX4016) was dripping PCB upon receipt. The amount is unknown.
2. Carrier claim reports have indicated some leaking capacitors, however, only in one case is there information that PCB's were introduced into the environment. On 5/20/74 at 2:00 A.M., an A&H Truck Lines Trailer truck loaded with 4 capacitor racks and other equipment, overturned on U.S. Route 50 about 17 miles southwest of Bedford, Indiana. In this accident, capacitors broke resulting in some loss of PCB. Leaking units were placed in sealed drums and sent to Chemtrol. Soaked dirt was shoveled up (by Westinghouse personnel) and put in sealed drums and sent to Chemtrol.
3. On 3/28/72 a Moss Trucking Co. truck veered off Route 158 approximately ten miles west of Roanoke Rapids, North Carolina. Five transformers were dumped from the truck trailer and approximately 1,000 gallons of Inerteen was spilled. The safety inspector for Moss Trucking Co. indicated that there were no creeks or water areas around the area and that there was no danger of polluting streams.

10. A description of any adverse health or environmental effects which you know or believe to have resulted from the introduction of PCB compounds or mixtures into the environment. Indicate any specific occasions including dates, times, location, amounts, and parties involved for which such effects are known.

We do not have any direct knowledge of any adverse health or environmental effects resulting from these compounds being introduced into the environment.



11. Any and all other information which you possess concerning:

- a. The production, installation, recclamation, use, distribution, and disposal of PCB compounds or mixtures.
- b. The discharge of PCB compounds or mixtures into the environment.

Westinghouse Electric Corporation provided direct testimony on these matters during the EPA Toxic Pollutant Hearings in 1974. In addition, we are aware that scientists for Monsanto Chemical Co. have published recent articles on the degradation of these compounds and that the Electronic Industries Association has furnished Mr. Russell Train additional information on these matters.

905062

NOTE (CHART)

The attached chart lists those Westinghouse Industry Services Divisions facilities which handle Polychlorinated Biphenyl Compounds.

Records are maintained for each project; however, these are not further coded to designate which project involved Polychlorinated Biphenyls. However, based upon the information available, disposal is to approved facilities when required.

| b.                     |    |    | 2d.                                                                            |  |  | 5b                      |    |    | 5c |    |   | 8b.                                 |                                  |  |
|------------------------|----|----|--------------------------------------------------------------------------------|--|--|-------------------------|----|----|----|----|---|-------------------------------------|----------------------------------|--|
| r inerteen<br>(pounds) |    |    | Westinghouse I.S.D. Location                                                   |  |  | Amount disposed<br>lbs. |    |    |    |    |   | Transporter of<br>disposed inerteen |                                  |  |
| 73                     | 74 | 75 |                                                                                |  |  | 71                      | 72 | 73 | 74 | 75 |   |                                     |                                  |  |
|                        |    |    | 2                                                                              |  |  |                         |    |    |    |    | 0 |                                     |                                  |  |
|                        |    |    | Augusta A.S.P.<br>9 Bowman Street<br>Boston, MA 04330                          |  |  |                         |    |    |    |    |   |                                     | Coles; Sanborn                   |  |
|                        |    |    | Baltimore A.S.P.<br>4015 Foster Avenue<br>Baltimore, MD 21224                  |  |  |                         |    |    |    |    |   |                                     | Roadway                          |  |
|                        |    |    | Bridgeport A.S.P.<br>540 Grant Street<br>P.O. BOX 5225<br>Bridgeport, CT 06610 |  |  |                         |    |    |    |    |   |                                     |                                  |  |
|                        |    |    | Boston A.S.P.<br>60 Charles Street<br>Needing Heights, MA<br>02194             |  |  |                         |    |    |    |    |   |                                     | Jones                            |  |
|                        |    |    | Buffalo A.S.P.<br>1132 Seneca Street<br>Buffalo, NY 14210                      |  |  |                         |    |    |    |    |   |                                     | Westinghouse                     |  |
|                        |    |    | Chicago A.S.P.<br>3900 West 41st Street<br>Chicago, IL 60632                   |  |  |                         |    |    |    |    |   |                                     |                                  |  |
|                        |    |    | Cleveland A.S.P.<br>4600 West 160th St.<br>Cleveland, OH 44135                 |  |  |                         |    |    |    |    |   |                                     |                                  |  |
|                        |    |    | Cincinnati A.S.P.<br>1055 Larwood Avenue<br>Cincinnati, OH 45217               |  |  |                         |    |    |    |    |   |                                     | Westinghouse<br>Gateway; Western |  |
|                        |    |    | Detroit A.S.P.<br>19057 Allen Road<br>Troy, MI 48063                           |  |  |                         |    |    |    |    |   |                                     |                                  |  |

Deleted



25.  
 ermer inerteen  
 sed (pounds)

Westinghouse I.S.D.  
 Location

72

73

74

75

Charlotte A.S.P.  
 920 Eastway Drive  
 Box 12037  
 Charlotte, NC 28205

Denver A.S.P.  
 200 Rio Grande Blvd.  
 Denver, CO 80223

Emeryville A.S.P.  
 5899 Peladeau St.  
 Emeryville, CA  
 94608

Fort Worth A.S.P.  
 2475 E. Long Ave.  
 Ft. Worth, TX 76106

Houston A.S.P.  
 5730 Clinton Drive  
 Houston, TX 77020

Kansas City A.S.P.  
 6140 Front Street  
 Kansas City, MO  
 64120

Los Angeles A.S.P.  
 18029 S. Santa Fe Ave  
 Compton, CA 90223

Mobile A.S.P.  
 65-67 Sidney Phillips  
 Drive, Mobile, AL  
 36607

*Deleted*

905066

5b

5c

Amount disposed  
lbs.

Transporter of  
disposed inerteen

71

72

73

74

75

*Deleted*

Westinghouse

Middlewest  
Freightways

Rams Express

| 7b.                                                                          |    |    | 2d.                                                                               |    |    | 5b             |    |  |  |  | 5c                                  |  |  | 8b. |  |  |
|------------------------------------------------------------------------------|----|----|-----------------------------------------------------------------------------------|----|----|----------------|----|--|--|--|-------------------------------------|--|--|-----|--|--|
| inerteen<br>(pounds)                                                         |    |    | Westinghouse I.S.D. Amount disposed<br>Location lbs.                              |    |    |                |    |  |  |  | Transporter of<br>disposed inerteen |  |  |     |  |  |
| 73                                                                           | 74 | 75 | 71                                                                                | 72 | 73 | 74             | 75 |  |  |  |                                     |  |  |     |  |  |
| <i>Deleted</i>                                                               |    |    | Minneapolis A.S.P.<br>2303 Kennedy St. N.E.<br>Minneapolis, MN 55410              |    |    | <i>Deleted</i> |    |  |  |  | Dohrn                               |  |  |     |  |  |
|                                                                              |    |    | Marietta A.S.P.<br>116 Industry Road<br>Marietta, OH 45750                        |    |    |                |    |  |  |  |                                     |  |  |     |  |  |
|                                                                              |    |    | Philadelphia A.S.P.<br>126 S. 30th Street<br>Philadelphia, PA<br>19104            |    |    |                |    |  |  |  | Hall                                |  |  |     |  |  |
|                                                                              |    |    | Richmond A.S.P.<br>1091 East 4th Street<br>Richmond, VA 23224                     |    |    |                |    |  |  |  | Wilson                              |  |  |     |  |  |
|                                                                              |    |    | Springfield A.S.P.<br>150 Tapley Street<br>P.O. BOX 1611<br>Springfield, MA 01101 |    |    |                |    |  |  |  | Inland express                      |  |  |     |  |  |
|                                                                              |    |    | Utica A.S.P.<br>Truck Route 5-A<br>Box 270, Utica NY<br>13502                     |    |    |                |    |  |  |  |                                     |  |  |     |  |  |
| Wilkes-Barre A.S.P.<br>267 N. Pennsylvania<br>Ave., Wilkes Barre<br>PA 18702 |    |    |                                                                                   |    |    |                |    |  |  |  |                                     |  |  |     |  |  |
| Columbus A.S.P.<br>141 S. Glenwood Avenue<br>Columbus, OH 43222              |    |    |                                                                                   |    |    |                |    |  |  |  |                                     |  |  |     |  |  |

| 2b. former inerteen based (pounds)                             |    |    |    |  | 2a. Westinghouse I.S.D. Location                                       |         |    |    |    | 5b. Amount disposed lbs. |  |  |  |  | 5c. Transporter of disposed inerteen |  |  |  |  |
|----------------------------------------------------------------|----|----|----|--|------------------------------------------------------------------------|---------|----|----|----|--------------------------|--|--|--|--|--------------------------------------|--|--|--|--|
| 72                                                             | 73 | 74 | 75 |  | 71                                                                     | 72      | 73 | 74 | 75 |                          |  |  |  |  |                                      |  |  |  |  |
| Delstat                                                        |    |    |    |  | Portland A.S.P.<br>614 N. Tillamook St.<br>Portland, OR 97227          | Delstat |    |    |    |                          |  |  |  |  | Westinghouse<br><br>unknown          |  |  |  |  |
|                                                                |    |    |    |  | Phoenix A.S.P.<br>1325 E. Jefferson St.<br>Phoenix, AZ 85034           |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |
|                                                                |    |    |    |  | Savannah A.S.P.<br>246 Lathrop Avenue<br>Savannah, GA 31402            |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |
|                                                                |    |    |    |  | Salt Lake A.S.P.<br>1600 S. Redwood Rd.<br>Salt Lake City, UT 84104    |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |
|                                                                |    |    |    |  | St. Louis A.S.P.<br>1565 Vandeventer Ave<br>St. Louis, MO 63110        |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |
|                                                                |    |    |    |  | Tampa A.S.P.<br>9597 Adams Drive<br>Tampa, FL 33619                    |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |
|                                                                |    |    |    |  | Indianapolis A.S.P.<br>551 W. Merrill Street<br>Indianapolis, IN 46225 |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |
| Milwaukee A.S.P.<br>1500 W. Cornell St.<br>Milwaukee, WI 53209 |    |    |    |  |                                                                        |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |
| Milwaukee, WI 53209                                            |    |    |    |  |                                                                        |         |    |    |    |                          |  |  |  |  |                                      |  |  |  |  |

ENVIRONMENTAL





## Instructions for Outdoor Capacitor Units



11-23-4114

Outdoor capacitor units are designed for use in distribution equipment for the purpose of increasing the capacity of the system. They are intended to be mounted outdoors in a weather-protected location, and require no additional protection from the weather under ordinary service conditions.

### RECEIVING

When received, carefully inspect the unit for damage and check the shipping tags to be sure that the desired rating has been received and that a shipping tag is attached to the carrier for any damaged units. In the event of damage, notify the nearest Westinghouse Sales Office.

### INSTALLATION

**Capacitor Ratings.** Many capacitors are available, including those listed in the Standards, and all meet the requirements of these standards.

The minimum continuous operating voltage is 110 percent of the rated voltage. When installing capacitors, check the nameplate of the unit to be sure that it has the proper rating for the circuit.

**Mounting Capacitors.** Standard hanger brackets for use with these units are available and are furnished as a separate item when ordered. When mounted otherwise than in standard hangers, care should be used to obtain the necessary spacing and clearances.

The standard hanger brackets will accommodate any combination of two conductors from #12 solid to 21 stranded wire. Terminals should be tightened firmly, but avoid excessive force (torques of more than 20 foot pounds are not necessary or recommended). The minimum spacing between large sizes of conductors should never be less than that recommended by your Westinghouse Sales Representative.

**Fusing.** A capacitor installation should be fused to remove the equipment from the line in case of a faulty unit. Fuses are not normally applied for overvoltage protection.

The fuse must have enough thermal capacity to prevent blowing on full surges and charging currents. It should also be able to clear the fault quickly to avoid rupture of the capacitor case and consequent damage to other units or equipment.

**Lightning Arresters and Grounding.** The capacitor should be grounded by a lightning arrester having an equipment rating and pole top clearance which is related to the ground at the base of the pole. The arrester should be hung from the pole top by a solid rod to the lightning arrester ground connection.

### MAINTENANCE

For capacitor maintenance, see the instructions for the capacitor in the Standards. The capacitor should be inspected for signs of leakage, oil leakage, or other signs of trouble. The capacitor should be inspected for signs of trouble at least once a year. The capacitor should be inspected for signs of trouble at least once a year.

When a capacitor is found to be defective, it should be removed from the line and replaced with a new one. The capacitor should be replaced with a new one of the same rating. The capacitor should be replaced with a new one of the same rating. The capacitor should be replaced with a new one of the same rating.

**Field Tests.** The insulation of a capacitor unit may be tested by applying 110 percent of the rated voltage between line or from terminals to a solid from a suitable protected ground terminal (terminal test). The test voltage of the test should be at least 1.1 times the rated voltage.

The capacitor unit should be tested for leakage current by applying a full voltage between terminals. The leakage current should be measured and recorded. The leakage current should be measured and recorded. The leakage current should be measured and recorded.

For more detailed instructions, see the instructions for the capacitor in the Standards. The capacitor should be tested for leakage current by applying a full voltage between terminals. The leakage current should be measured and recorded. The leakage current should be measured and recorded.

**Caution:** When the capacitor is disconnected, it should be grounded to avoid the danger of electrical discharge or explosion. The capacitor should be grounded to avoid the danger of electrical discharge or explosion.

### DISPOSAL

This product contains chlorinated hydrocarbon fluid, which is a hazardous material. It should be disposed of in accordance with local, state, and federal laws. The capacitor should be disposed of in accordance with local, state, and federal laws.

Westinghouse Electric Corporation

Distribution Apparatus Division  
Bloomington, Indiana 47401

Printed in U.S.A.

Westinghouse Electric Corporation

Distribution Apparatus Division, Bloomington, Indiana 47401

Effective January 1971

## CURRICULUM VITAE

Thomas G. Munson  
1001 8th Ave S.E.  
St. Cloud, MN 56304

EDUCATION: University of Wisconsin  
Madison, Wisconsin

1965-1968 Ph.D. Biochemistry  
Dissertation: Nitrogen Fixation by Rhodospirillum rubrum  
Grown in Nitrogen-limited Continuous Culture  
Major Advisor: Dr. Robert H. Burris

1963-1965 M.S. Biochemistry  
Dissertation: Cofactor Requirements for Nitrogen Fixation  
by Extracts of Clostridium pasteurianum  
Major Advisor: Dr. Robert H. Burris  
\* National Institutes of Health Trainee  
\* National Science Foundation Research Fellow  
\* Instructor in course "Radio-isotope Techniques"

University of California  
Berkeley, California

1959-1963 B.A. Zoology  
\* Four-year California State Scholarship  
\* Alpha Chi Sigma Professional Chemistry Fraternity

### EXPERIENCE:

SEPT 1987 St. Cloud State University  
to PRESENT Department of Chemistry  
St. Cloud, MN 56301

Associate Professor

- \* Teaching
  - First two quarters of freshman chemistry
  - Introduction to forensic science
  - Advanced forensic science laboratory
- \* Honors and Awards
  - Curriculum development grant
  - Membership in Phi Kappa Phi
  - Editorial Board, Crime Laboratory Digest

APR 1982 Forensic Science Research Unit  
to SEPT 1987 Federal Bureau of Investigation  
FBI Academy  
Quantico, Virginia

Research Chemist

905070

- \* Principal projects included:
  - Comparison of adhesives by pyrolysis GC/MS
  - Analysis of gunpowder by capillary GC/MS
  - Analysis of automotive paints by pyrolysis capillary GC/MS
  - Sex typing human blood by capillary GC/MS
  - Discrimination of human hair by pyrolysis capillary GC/MS and GC/MS/MS
  - Characterization of gasolines by capillary GC
  - Comparison of photocopy toners by pyrolysis capillary GC and GC/MS
- \* Lecturer/lab instructor in the short courses:
  - Chromatographic Methods in Forensic Science
  - Explosives Analysis
  - Paint and Polymer Analysis
  - Arson Analysis

NOV 1976  
to APR 1982

Central Regional Laboratory, Region 3  
U. S. Environmental Protection Agency  
Annapolis, Maryland

Chemist

- \* Chief of the Organics Analysis Unit
- \* Senior GC/MS analyst--performed nearly a thousand analyses of surface waters, drinking waters, effluent discharges and landfill leachates for organic chemical contaminants
- \* Designated Regional Expert in Toxic Substances--provided assistance in many of the regional enforcement efforts, including court testimony

MAY 1976  
to NOV 1976

Chesapeake Bay Program  
U. S. Environmental Protection Agency  
Annapolis, Maryland

Environmentalist

- \* Designed the initial phases of the Toxics Program

MAY 1969  
to MAY 1976

Westinghouse Ocean Research Laboratory  
Annapolis, Maryland

Senior Scientist

- \* Performed research on environmental contamination of marine and estuarine ecosystems by chlorinated pesticides and polychlorinated biphenyls (PCB's)
- \* Performed laboratory studies on the toxic effects of chlorinated pesticides and PCB's on oysters and soft-shelled clams.
- \* Directed the efforts of the Aquatic Biological Sciences Group of WORL in a study of the movement of chlorinated hydrocarbons in the Chester River Estuary (a \$250,000 program for the State of Maryland)

- \* Served as Chief Scientist on the Upper Bay Survey, a \$750,000 multi-disciplinary, multi-institutional program to investigate the rates and routes, sources, sinks and reservoirs of chlorinated hydrocarbons in the Upper Chesapeake Bay (funded by the State of Maryland)
- \* Performed environmental surveys around all Westinghouse Electric Corporation manufacturing plants which used PCB's

JAN 1968            Enchanter, Inc. Oceanographic Research  
to MAY 1969        Newport Beach, California

Vice President

- \* Performed underwater surveys, current studies and contract research related to sewage disposal in near shore waters of California

#### HOBBIES & OTHER

ACTIVITIES:        Reading, running, cycling, writing, teaching an adult Sunday School class

#### { PUBLICATIONS:

##### Publications in Scientific Journals (\* written by T.O.M.)

1. The adenosine triphosphate requirement for nitrogen fixation, M. J. Dilworth, D. Subramanian, T. O. Munson and R. H. Burris, Biochem. Biophys. Acta 99: 486-503(1965).
- \*2. Method for demonstrating cofactor requirements for nitrogen fixation, T. O. Munson, M. J. Dilworth and R. H. Burris, Biochem. Biophys. Acta 104: 278-281(1965).
- \*3. Nitrogen fixation by Rhodospirillum rubrum grown in nitrogen-limited continuous culture, T. O. Munson and R. H. Burris, J. Bacteriol. 97: 1093-1098(1969).
- \*4. Chlorinated hydrocarbon residues in marine animals of southern California, T. O. Munson, Bull. Environ. Contamin. and Toxicol. 7: 223-228(1972).
- \*5. Current status of research on the biological effects of pesticides in the Chesapeake Bay, T. O. Munson and R. J. Huggett, Chesapeake Sci. 13: 154-156(1972).
- \*6. A note on toxaphene in environmental samples from the Chesapeake Bay region, T. O. Munson, Bull. Environ. Contamin. and Toxicol. 16: 491-494(1976).
- \*7. Purge-and-trap analysis using fused silica capillary column GC/MS, F. A. Dreisch and T. O. Munson, J. Chrom. Sci. 21: 111-118(1983).
- \*8. Comparison and identification of adhesives used in improvised explosive devices by pyrolysis capillary column GC/MS, N. L. Bakowski, E. C. Bender and T. O. Munson, J. Anal. and Appl. Pyrol. 8: 483-492(1985).
- \*9. Comparison of human hair by pyrolysis capillary column GC and GC/MS, Jeffery Vick and T. O. Munson, J. Anal. and Appl. Pyrol. 8: 493-501(1985).
- \*10. Chemistry and the FBI, T. O. Munson and L. C. Davidson, J. Chem. Ed. 62: 1054-1057(1985).

11. Examination of automotive paints by pyrolysis capillary gas chromatography/mass spectrometry, D. McMin, T. L. Carlson and T. O. Munson, J. Foren. Sci. 30: 1064-1073(1985).
- \*12. Getting started with pyrolysis capillary gas chromatography, T. O. Munson, Crime Lab. Digest 13: 82-91(1986).
- \*13. A survey of the use of analytical pyrolysis by forensic laboratories in the United States, T. O. Munson, Crime Lab. Digest 14: 112-117(1987).
- \*14. Evidence for the formation of 2,4-imidazolidinediones and pyrrolidinol[1,2a]-3,6-piperazinediones in human hair pyrolyzate by pyrolysis-gas chromatography-mass spectrometry-mass spectrometry, T. O. Munson and D. D. Fetterolf, J. Anal. and Appl. Pyrol. 11: 15-24(1987).
- \*15. The status of hair comparisons by pyrolysis gas chromatography, T. O. Munson, Crime Lab. Digest 14: 153-154(1987).
16. The comparison of black polyvinylchloride (PVC) tapes by pyrolysis gas chromatography, E. R. Williams and T. O. Munson, J. Foren. Sci. 33: 1163-1170(1988).
- \*17. A simple method for sampling photocopy toners for examination by gas chromatography, T. O. Munson, Crime Lab. Digest (in press).
- \*18. The classification of photocopy toners by pyrolysis gas chromatography-mass spectrometry, T. O. Munson, J. Foren. Sci. (in press).

Other Publications (\* written by T. O. M.)

1. Intermediates and cofactors in nitrogen fixation, R. H. Burris, H. C. Winter, T. O. Munson and J. Garcia-Rivera, in Non-heme Iron Proteins: Role in Energy Conversion, A. San Pietro, ed., the Antioch Press, Yellow Springs, Ohio, 1965.
- \*2. Chapter 2: Biochemical Investigations, T. O. Munson, in Chester River Study: a Joint Investigation by the State of Maryland Department of Natural Resources and Westinghouse Electric Corporation, W. D. Clarke, H. D. Palmer, and L. C. Murdock, eds., Westinghouse Ocean Research Laboratory, Annapolis, Maryland, 1973.
- \*3. Section VI-D: Chlorinated hydrocarbon analysis of sediment samples, T. O. Munson, in Environmental Survey of an Interim Ocean Dumpsite, Cruise Report:1-5 May 1973, compiled and edited by H. D. Palmer and D. W. Lear, Annapolis Field Office, Environmental Protection Agency, Annapolis, Maryland.
- \*4. Chapter 6: Biochemistry, T. O. Munson, in Upper Bay Survey, Final Report to the Maryland Department of Natural Resources, Vol. II, T. O. Munson, D. K. Ela and C. Rutledge, eds., Westinghouse Oceanic Division, Annapolis, Maryland, 1975.
- \*5. Transport of chlorinated hydrocarbons in the Upper Chesapeake Bay, T. O. Munson, H. D. Palmer and J. M. Fornis, in National Conference on Polychlorinated Biphenyls, Conference Proceedings, Mar. 1976, GPO EPA-560/6-75-004.
- \*6. Chesapeake Bay pollution: need for study of chronic toxicities, T. O. Munson, The Capitol Chemist 29(6): 30(1979).
7. Survey of the Huntington and Philadelphia River water supplies for purgeable organic contaminants, F. A. Dreisch, M. Gower and T. O. Munson, U. S. Environmental Protection Agency Report, EPA-903/9-81-003, Nov. 1980.

8. Identification of smokeless powders and their residues by capillary column gas chromatography/mass spectrometry, R. M. Martz, T. O. Munson, and L. D. Lasswell, III, in Proceedings of the International Symposium on the Analysis and Detection of Explosives, Mar 1983, GPO 1984-426-295.
- \*9. Examination of automotive paints by pyrolysis capillary gas chromatography/mass spectrometry, T. O. Munson, T. L. Carlson and Dennis McMinn, in Proceedings of the International Symposium on the Analysis and Identification of Polymers, Aug 1984, GPO-027-000-01265-5.

Research Reports at Scientific Meetings (\*presented by T. O. M.)

- \*1. Cofactor requirements for biological nitrogen fixation, with R. H. Burris, Fed. Proc. 24: 541(1965).
- \*2. Movement of chlorinated hydrocarbons in the Chester River estuary, with H. D. Palmer and J. D. Tasler, presented at the Annual Meeting of the American Chemical Society, New York, New York, August 1972.
3. Scanning microscopy observations of oyster shell growth during pesticide toxicity experimentation, with J. M. Fornis, presented at the 36th Annual Meeting of the American Society of Limnology and Oceanography, 1973.
4. Presence of alpha and gamma chlordane in the Chester River estuary, with J. D. Tasler, presented at the 87th Annual Meeting, Association of Official Analytical Chemists, Washington, D.C. 1973.
5. Effect of hydrological processes on the transport of sediment and pesticides in the Chester River, Maryland, with K. T. S. Tzou and H. D. Palmer, presented at the Annual and National Environmental Engineering Meeting of the American Society of Civil Engineers, Oct. 29-Nov 1 1973.
6. In situ evaluations of PCB uptake by Mya arenaria and Crassostrea virginica, with J. M. Fornis, presented at the 3rd International Research Federation Conference: Recent Advances in Estuarine Research, Galveston, Texas, 1975.
- \*7. Transport of chlorinated hydrocarbons in the Upper Chesapeake Bay, with H. D. Palmer and J. M. Fornis, presented at the National Conference on Polychlorinated Biphenyls, Chicago, Illinois, Nov. 19-21 1975.
- \*8. Synopsis of the Chester River Study--sedimentation, river flow, organic chemical and heavy metals data, presented at the Chester River Workshop, Horn Point, Maryland, Feb. 23 1977.
9. Chlorinated hydrocarbons in the Upper Chesapeake Bay, with D. M. DiSpirito, presented at the 11th Middle Atlantic Regional Meeting of the American Chemical Society, Newark, Delaware, Apr. 20-23 1977.
- \*10. The measurement of PCB's in landfill leachates at the parts-per-trillion level, presented at the 11th Middle Atlantic Regional Meeting of the American Chemical Society, Newark, Delaware, Apr. 20-23 1977.
- \*11. Priority pollutants--the need for organic residue analysis, presented at the Workshop on Organic Residue Analyses in Seafood, Virginia Institute of Marine Sciences, Gloucester Point, Virginia, Feb. 2-3 1978.

12. Discovery of a source of carbon tetrachloride in public drinking water, with J. W. Barron, presented at the 12th Middle Atlantic Regional Meeting of the American Chemical Society, Hunt Valley, Maryland, Apr. 5-7 1978.
- \*13. GC/MS/DS Analysis of organic chemicals entering groundwater from a landfill, with J. J. Austin, Jr., and J. W. Barron, presented at the 12th Middle Atlantic Regional Meeting of the American Chemical Society, Hunt Valley, Maryland, Apr. 5-7 1978.
- \*14. Monitoring of the Upper Chesapeake Bay for the S-triazine herbicides Atrazine and Simazine, with J. J. Austin, Jr. and R. C. Bubeck, presented at the 12th Middle Atlantic Regional Meeting of the American Chemical Society, Hunt Valley, Maryland, Apr. 5-7 1978.
- \*15. Examples of contaminant identification by gas chromatography/mass spectrometry, presented at the 844th meeting of the Chemical Society of Washington, meeting jointly with the Mass Spectrometry Discussion Group of the Greater Washington Area, College Park, Maryland, Dec. 1978.
- \*16. Priority pollutants in water, presented at the Organic Residue Workshop, Virginia Institute of Marine Science, Gloucester Point, Virginia, Mar. 19-20 1979.
- \*17. The presence of gaseous halocarbons in landfill leachates, with E. R. Trovato, J. L. Slayton and J. J. Austin, Jr., presented at the 15th Middle Atlantic Regional Meeting of the American Chemical Society, Washington, D. C., Jan. 1981.
- \*18. Contamination of drinking water supplies by purgeable halogenated hydrocarbons, with F. A. Dreisch, presented at the 15th Middle Atlantic Regional Meeting of the American Chemical Society, Washington, D.C., Jan. 1981.
- \*19. EPA GC/MS Methodology, presented at the March meeting of the Delaware Valley Mass Spectral Topics Discussion Group, King of Prussia, Pennsylvania, Mar. 1981.
- \*20. Analysis of gunshot residues by capillary GC and GC/MS, with N. L. Bakowski, presented at the Mid-Atlantic Association of Forensic Scientists, Baltimore, Maryland, Apr. 1983.
- \*21. Use of capillary column gas chromatography and capillary column GC/MS at the FBI Laboratory, presented at the Northwest Association of Forensic Scientists Meeting, Missoula, Montana, May 1983.
- \*22. Sex determination from dried bloodstains by GC/MS?, presented at the Northwest Association of Forensic Scientists Meeting, Missoula, Montana, May 1983.
- \*23. Sex Determination from dried bloodstains by GC/MS?, presented at the 31st Annual Conference on Mass Spectrometry and Allied Topics, Boston, Massachusetts, May 1983.
- \*24. Chemistry and the FBI, presented at the American Chemical Society National Meeting, Washington, D.C., Aug. 1983.
- \*25. The application of analytical pyrolysis using capillary column GC and GC/MS to forensic samples: automobile paints, adhesives, plastics, and hair, presented at the Mid-Atlantic Association of Forensic Scientists Meeting, Harpers Ferry, West Virginia, Oct. 1983.
- \*26. The comparison of automobile paint samples by pyrolysis capillary column gas chromatography/mass spectrometry, with Dennis McMinn and T. L. Carlson, presented at the Mid-Atlantic Association of Forensic Scientists Meeting, Harpers Ferry, West Virginia, Oct. 1983.

27. Capillary pyrolysis GC/MS of adhesives in bombing investigations, with N. L. Bakowski, and E. C. Bender, presented at the Mid-Atlantic Association of Forensic Scientists--Northeastern Association of Forensic Scientists Combined Meeting, Atlantic City, New Jersey, Apr. 1984.
- \*28. Examination of automotive paints by pyrolysis capillary gas chromatography/mass spectrometry, with Dennis McMinn and T. L. Carlson, presented at the International Symposium on the Analysis and Identification of Polymers, Quantico, Virginia, Jul. 1984.
- \*29. Comparison and identification of adhesives used in improvised explosive devices by pyrolysis capillary column GC/MS, with N. L. Bakowski and E. C. Bender, presented at the 6th International Symposium on Analytical and Applied Pyrolysis, Weisbaden, Federal Republic of Germany, Sep. 1984.
- \*30. Comparison of human hair by pyrolysis capillary column GC and GC/MS, with Jeffery Vick, presented at the 6th International Symposium on Analytical and Applied Pyrolysis, Weisbaden, Federal Republic of Germany, Sep. 1984.
- \*31. Pyrolysis capillary gas chromatography/mass spectrometry/mass spectrometry of human hair, with D. D. Fetterolf, presented at the 33rd Annual Conference on Mass Spectrometry and Allied Topics, San Diego, California, May 1985.
- \*32. An overview of the FBI Forensic Science Research and Training Center, presented at the 67th Semi-annual Seminar, California Association of Criminalists, Concord, California, May 1986.
- \*33. Recent applications of pyrolysis-gas chromatography-mass spectrometry in forensic science, presented at the 7th International Symposium on Analytical and Applied Pyrolysis, Reading, England, Sep. 1986.
- \*34. Evidence for the formation of 2,4-imidazolidinediones and pyrrolidino[1,2a]-3,6-piperazinediones in human hair pyrolyzate by pyrolysis-gas chromatography-mass spectrometry-mass spectrometry, T. O. Munson and D. D. Fetterolf, presented at the 7th International Symposium on Analytical and Applied Pyrolysis, Reading, England, Sep. 1986.
- \*35. Comparison of photocopy toners by pyrolysis capillary gas chromatography, presented at the Midwestern Association of Forensic Scientists Fall'88 Meeting, Minneapolis, Minnesota, Oct. 1988.