UNITED STATES DISTRICT COURT
DISTRICT OF SOUTH CAROLINA
ANDERSON DIVISION

CAROLE M. WHITFIELD, et al.,	)	
	)	
PLAINTIFFS,	)	
vs.	)	No. 8-84-3184-14
	)	
SANGAMO-WESTON, INC., et al.,	)	
	)	
DEFENDANTS.	)	

Deposition of **WILLIAM B. PAPAGEORGE**
taken on behalf of the Plaintiffs.

G O R E R E P O R T I N G C O M P A N Y
408 Olive Street St. Louis, Missouri
241-6750

WATER_PCB-SD0000060734

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SANGAMO-WESTON, INC., et al.,	)	
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Deposition of **WILLIAM B. PAPAGEORGE**, taken on behalf of the Plaintiffs at the Marriott Airport Hotel, Room 3114, in the County of St. Louis, State of Missouri, on the 10th day of July, 1987 before Vickie L. Huelsman, Registered Professional Reporter and Notary Public.

WATER_PCB-SD0000060735

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WILLIAM B. PAPAGEORGE,

of lawful age, having been first duly sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, deposes and says in reply to oral interrogatories propounded as follows, to-wit:

DIRECT EXAMINATION

QUESTIONS BY MR. BONDS:

Q. Mr. Papageorge, if you would, state your full name and your address.

A. William B. Papageorge, 321 Pebble Valley Drive, St. Louis, Missouri, 63141.

Q. How old are you, Mr. Papageorge?

A. Sixty-four.

Q. If you would, tell me about your formal education after high school.

A. I received a Bachelor of Science degree in chemical engineering in 1943 from Washington University in St. Louis, and a Master of Science in chemical engineering of the same university in 1947, and I have postgraduate course credits from what is now known as Oklahoma State University, Stillwater, Oklahoma.

Q. What were those in?

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A. It was at that time working toward a doctorate degree.

Q. In?

A. In chemical engineering.

Q. And when did you attend the University -- Oklahoma State University?

A. These were off-campass courses. I don't mean to mislead you. I attended those courses in the period 1948 to '51.

Q. Did you subsequently obtain a Ph.D.?

A. No.

Q. How many hours did you have?

A. I don't recall exactly. I believe it's about a twelve or so -- twelve seventeen, somewhere in there.

Q. If you would, tell me about your employment history with Monsanto Company. If you can, I would appreciate it if you would break it down into dates, locations, job titles and duties.

A. All right. I'll try.

Q. Start from the beginning, if you would.

A. I started employment with Monsanto Company in November of 1951. Initial assignment was at the John F. Queeny Plant, Q-u-e-e-n-y,

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Plant located in St. Louis as a design engineer in their Plant Engineering Department. That assignment lasted about two years.

Q. What were your duties in that assignment?

A. Designing equipment which was to be used in the manufacture of a chemical to be made at that plant. Then I was assigned to go out into the completed unit and demonstrate that this equipment could function the way it was supposed to. That lasted, as best I remember, about six months. I was then assigned into other operating units in the plant as a supervisor of production, and that assignment was about a year.

Following that production assignment, I was assigned to the Maintenance Department as a supervisor. This ought to be about 1954, '55. Maintenance supervisor assignment was less than a year. I don't recall exactly how long.

I was then made the maintenance superintendent in the Maintenance Department. That lasted about almost two years.

I was then assigned back to the Plant Engineering Department as a superintendent, and that assignment was about a two-year assignment.

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That ought to take me up to about 1962.

I was then appointed as the general superintendent of a group that had miscellaneous activities, such as power distribution, steam generation, shipping and receiving, trash pick up; anything that didn't fit either into maintenance or manufacturing was assigned to that department, and that lasted until 1964. All of this occurred at the Queeny Plant in St. Louis.

In 1964, I was assigned to the Illinois Plant located in Sauget, S-a-u-g-e-t, Illinois as a general superintendent of manufacturing in which I had roughly a fourth of the production facilities at that plant.

In early 1965, I was transferred to the Anniston, Alabama Plant as plant manager, and I served that role, that function, to the end of 1969.

Beginning in January of 1970, I was assigned as -- the title of the assignment was manager, environmental control addressing PCBs exclusively. Along about -- and my assignment was in the general offices back in St. Louis at that time.

In about 1973, in addition to PCBs, I

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was assigned other products manufactured by Monsanto as part of my area of responsibility. That assignment remained about the same although the title changed from the initial title of manager, environmental control, it became manager, environmental progression tech, and finally it became manager, product acceptability. Different products would be taken away or added to my list.

In 1977, I was appointed a director of environmental operations for one of the operating units within Monsanto, and that title I retained until December, 1985. The operating assignment did change once in that period.

Following December of 1985, Monsanto Company reorganized, and I was made a manager of Occupational Health, and at the end of 1986, I retired.

Q. Have you been employed since your retirement?

A. I'm self-employed.

Q. And what do you do?

A. Consulting on PCBs.

Q. Do you consult for the Monsanto Company on PCBs?

A. Indirectly, yes.

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Q. The duties that you had while you were at the Queeny Plant in St. Louis, did that -- did those duties give you any responsibility for the disposal of any chemical waste that might be generated by the manufacturing process?

A. Yes. Through that period of time to different degrees and in different ways. In some instances, I was responsible for the unit generating the waste, and I had to make certain it was collected properly and deposited in the proper area and made arrangements through my supervisors and foreman that the arrangements were made for proper pick up and disposal.

Later when I was general superintendent of the miscellaneous operations that I described, the teams working with handling of waste and disposal reported in my organization so as a result, I was in a way more directly involved.

Q. As the supervisor of that function?

A. As the superintendent which another level of superintendent would report and finally the supervisor and then the foreman.

Q. When you went to the Sauget Plant, did you have any responsibilities for disposal of chemical waste generated by the manufacturing

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process?

A. I had responsibilities associated with generation of sump-type waste and the proper packaging, segregation and arrangement for pick up.

Q. At the Anniston Plant, did you have duties with regard to waste disposal?

A. Yes.

Q. Did you also have duties with regard to the manufacture of PCBs at that plant?

A. Yes.

Q. If you would, would you just go through the steps that were followed at the Anniston Plant from the raw material necessary to create PCBs to the finished product?

A. Yes. The raw materials consisted of benzene, chlorine, iron oxide and lime, as best I remember.

Q. Okay.

A. The benzene would be introduced into equipment that would expose it to high temperatures under high pressure to form, along with other chemicals, the biphenyl, which was extracted from these other chemicals by the refining process. The biphenyl --

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Q. Let me stop you there. Biphenyl, by that you mean two benzene rings that are joined together?

A. Yes.

Q. And that forms a biphenyl molecule?

A. Yes. But it's got to be formed -- in order to be a biphenyl, it has to be -- the joining has to be very specific.

Q. And --

A. Because other joining could give you other chemicals.

Q. Okay.

A. So this joining, if I can describe it orally, is a carbon-to-carbon coupling.

Q. And as I understand the process, the carbon-to-carbon coupling would occur when a hydrogen atom would be replaced or leave the carbons in place and they would bond?

A. Yes. There would be -- two hydrogens would be released.

Q. Okay. Would you draw the benzene ring that you started with, please, and label that 1?

A. (Indicating). A common way to show the benzene ring is this arrangement of carbons with an internal circle indicating these couplings

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change in the molecule.

Q. Those are the lines that you have drawn between the Cs?

A. Yes.

Q. Is there hydrogen in that ring at any point?

A. Yes. At each carbon, there's also a hydrogen associated (indicating).

Q. Okay. Now, if you would, could you draw the benzene ring as -- the diphenyl as it looks after the two benzene rings have been joined in that process that you described?

A. All right. (Indicating).

(Discussion off the record)

A. Okay. That diagram represents to the chemist the biphenyl chemical.

MR. BONDS: Now, you indicated that there would be other compounds created in that process. What would they be?

A. Well, certainly hydrogen is formed because of the two hydrogens associated with these carbons that are joined now (indicating).

Q. All right.

A. Sometimes three benzene rings will combine --

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Q. And that would be --

A. -- in different ways to make the various terphenyls and occasionally there will be four combining in many waste to form quatraphenyls.

Q. Okay.

A. And I'm of the understanding that there are other unidentified long chain tarry materials formed also.

Q. Called montars?

A. They are in the final material of Monsanto called montars.

Q. Did you intentionally make terphenyls and quatraphenyls in that process or is that a by-product of making biphenyl?

A. It is a by-product.

Q. Did you use the terphenyls and the quatraphenyls for any additional chemical process at Monsanto?

A. Yes.

Q. Are there any other materials created in that process that you've not discussed, to your knowledge?

A. I don't know of any other.

Q. Okay. Is that process called pyrolysis?

A. Yes.

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Q. As I understand that term, that is the heating of the benzene in a tube without oxygen being present; is that correct?

A. That is correct.

Q. What if oxygen were to be present in that reaction? What would that create?

A. An explosion could occur, for one thing. That's why we had to keep oxygen out. It would vary with the amount of oxygen as related to the amount of benzene and the temperature as to what final mixture, and I would predict personally there would be a mixture of chemicals formed under those conditions.

Q. The temperature, as I understand it, in that particular process was around eight hundred C?

A. Yes.

Q. Would it be possible if oxygen were introduced into the process for dibenzofurans to be created?

A. You say it's possible? Yes.

Q. Do you know whether or not they were created in the process?

A. I have never seen anything that tells me that they were created.

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Q. Now, take me through the next step. We've got the biphenyl.

A. Biphenyl at room temperature is a solid looks very much like candle wax. It is heated enough to make it a fluid, liquid, and it's pumped into a tank in which scrap iron is present because iron acts as the catalyst in this process.

In addition to that iron, we deliberately added iron oxide to make sure that enough iron was available and kept at an elevated temperature, we introduced gaseous chlorine bubbling through this molten bath. The chlorine would randomly attach itself to some of these carbons by displacing hydrogens. The hydrogen that is displaced would be combined with other chlorine to make hydrogen chloride gas.

The reaction would be terminated depended upon which final mixture was being sought. The production supervision would tell the operators we want to make a certain type of mixture. From years of experience, this was known to take so many hours of chlorine exposure, and this would be confirmed by the operators taking samples of the material to determine some properties that told them you've arrived at the

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right point or you still have some chlorination to do.

When that appropriate point is reached, the chlorine introduction is terminated. As much as of the free hydrogen chloride gas that's still in this container is removed from this mass. Any residual hydrogen chloride is neutralized by the addition of lime.

Following that neutralization, the material is subjected to a distillation step, which means it is heated at high enough temperature which was roughly, depending again on the mixture that was being produced, say, four hundred degrees centigrade or thereabouts, the vapors would boil off of the mass, would be condensed, and the liquid that was collected would be the finished product.

Q. And that would be poly chlorinated biphenyls?

A. Yes.

Q. Prior to the chlorination step and right after the first step where the diphenyl was created, is that mixture that existed of terphenyls, quatraphenyls, biphenyls and the montars distilled at any point?

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A. Yes. In order to get the biphenyl, there is a distillation step that is taken. The biphenyl is removed from the terphenyls and other materials.

Q. Is that done under a vacuum?

A. Yes.

Q. And --

A. It's a distillation.

Q. Do you recall the temperature that the liquid would be heated in that distillation process?

A. Not specifically. It's in the hundreds of degrees centigrade is my best recollection.

Q. All right. You mentioned in the chlorination step that the operator would perform certain tests to determine whether or not he'd reached his goal. I assume that the goal he was trying to reach was to create a mixture that contained a certain amount of chlorine by weight; is that correct?

A. Yes. That's another way to measure. Yes.

Q. Okay. My further understanding is that some of the PCB mixtures that Monsanto manufactured and sold were labeled and called

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Aroclors, and in the number that followed, that four-digit number, such as 1242, 1254, 1260; is that correct?

A. That is correct.

Q. My further understanding is that those Aroclors or PCBs and that Aroclor 1242 would be forty-two percent chlorine by weight?

A. Yes.

Q. In this process that you've described, were there any waste streams created during the manufacturing process?

A. Well, there were streams other than the finished product.

Q. Okay. If you would, describe those.

A. All right. The hydrogen chloride gas that was removed from the material before it was distilled would be drawn by vacuum.

(Discussion off the record)

A. The hydrogen chloride gas that was withdrawn from the mass of material would be scrubbed with water, and the resulting mixture would be an acid, muriatic acid. That was eventually sold as a by-product.

After the distillation, the material that remained in the container, in the reaction

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vessel, would be a black tarry material that contained the terphenyls, the quatraphenyls and all the other unknowns, other tars, was sold as a montar by Monsanto.

There was some water in the process that contained water-soluable waste and anything else that would be carried with it, and that water would be introduced into a limestone pit where the residual acid would be neutralized, and were any PCBs present that were free would collect in this pit. I don't recall any other streams associated with the process.

MR. BONDS: At which point in the manufacturing process would the water stream be created?

A. There would be a -- you may recall the step at which we try to strip off the residual hydrogen chloride gas just before distillation, and during the addition of the lime, there's a vacuum pulled on the reaction mass, and that gas is sent through scrubbers, which use water as part of the vacuum creating system, and scrubbing system to prevent these gases from being released into the atmosphere freely. That water would be the waste water that we had to dispose of.

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Q. Do you know what percentage of PCBs would be present in that water? Would it be in a percent range, parts per million range?

A. I've never seen a number on that.

Q. This may be a hard question for me to phrase, but it's hard for me to sit here, I've listened to your description, but what volume -- say, if you were going to run a batch of 1242, what volume of water -- first of all, what volume of 1242 would be generally made on the average?

A. Oh, it would be about -- reaction vessels were two thousand gallon steel tanks, and it wouldn't be filled to the very top, but say fifteen hundred gallons, seventeen hundred gallons at a time.

Q. At a time?

A. Uh-huh.

Q. How many of those vessels would be operating, say, in 1960 at Anniston? I believe you went there in '61?

A. '65.

Q. '65.

A. We had -- as I remember, we had three individual reactors that were operated on a batch-by-batch basis, and there was one system

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that had, as I recall, three in a cascading arrangement; the one would overflow to the other, and by the time it came out, it had to appropriate chlorine affixed. So, in essence, there were about six vessels involved.

Q. How long would it take to make Aroclor 1242?

A. I don't recall vividly. It's twenty-four hours, something like that.

Q. The water stream that you mentioned, do you have an estimate of the number of gallons of water that would be generated by that process in a twenty-four-hour period from the scrubbing of the HCl?

A. Gosh, I don't know. I just don't remember.

Q. Would it be a thousand gallons?

A. Close.

Q. How large --

A. Close.

Q. How large were the holding ponds?

A. Oh, about as big as that swimming pool outside here. I don't know how to describe it.

Q. That would be an olympic-size swimming pool?

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A. About that size, yes.

Q. How many of those did you have?

A. Two.

Q. How long was the retention time of that particular water in the ponds?

A. I don't know. I don't remember.

Q. What happened to the PCBs -- first let me ask you this question: My understanding is that PCBs are heavier than water; is that correct?

A. That's correct.

Q. And they're insoluble in water up to about a point of two hundred parts per million; is that correct?

A. No.

Q. Okay. Correct me.

A. The soluablity of PCBs in water at most is two hundred parts per billion.

Q. Okay. All right. So the -- if I understand you correctly, these pits with the limestone in them were designed to neutralize acid and to allow PCBs to settle out of the water?

A. Yes.

Q. What would happen to the PCBs that settled out of the water?

A. Periodically -- and this would vary

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depending on the rate of production -- the ponds would be dredged, backhoed, and the sludge containing all kinds of material would be put in steel drums and hauled across our plant road to a plant landfill and deposited in that landfill.

Q. Was that landfill of the nature of a municipal landfill?

A. No. This is a privately-owned landfill, Monsanto's landfill.

Q. Do you know who designed it?

A. No, I don't.

Q. Do you know how it was designed, as far as where the water could leach out of the landfill or not?

A. I was aware that there were no water bodies nearby. It was really dug into a hillside, highly-elevated terrain. It had -- I forget the permeability, but it was an impervious clay that was used to cover the deposits every so often. I don't recall much else about it.

Q. Was the reason that it was put in a place with an impervious clay to keep PCBs and other chemicals leaving from the landfill into the water?

A. Yes.

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Q. Was this operation, as you have described it, at Anniston in 1955 the same as you've described it to me today?

A. '55?

MR. MARION: If you know.

A. During 1955, what was basically there was enlarged and improved but basically the same procedure.

MR. BONDS: The pits were there, the landfill?

A. It was a single pit and smaller, and they made two so they could dredge one while they used the other --

Q. When they increased the size?

A. -- to accommodate the increased production.

Q. How were -- well, let me back up a second. When is the first time you ever became aware of Sangamo Electric Company?

A. Early 1970.

Q. How did you come to find out there was a Sangamo Electric Company in 1970?

A. In early 1970, we had a mailing to all customers of Monsanto's PCBs, and the mailing lists that I saw at the time were broken down into

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types of uses and customers by use, and that was my first exposure to Sangamo Electric Company as a customer.

Q. Do you know whether or not Sangamo Electric Company had been buying PCBs from Monsanto Company?

A. That's my understanding. Yes.

Q. Do you know which types they bought and what they used it for?

A. Yes, sir.

Q. Go ahead. What were they?

A. It's my understanding they made capacitors, and they used Monsanto's Aroclor 1242 mostly and a little bit of Aroclor 1254.

Q. Do you know where they were located within South Carolina?

A. Yes.

Q. Where was that?

A. Pickens, South Carolina.

Q. Do you have any understanding as to the number of years they had purchased this material from Monsanto?

A. No.

Q. Do you have any idea of the volume that they were purchasing in 1965, '70?

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A. Relative idea.

Q. Okay. What's your understanding?

A. Of Monsanto's customers, I would suggest that in my understanding, that Sangamo Electric was considered a small customer.

Q. Okay. Behind which large customers?

A. The larger customers were the General Electric, Westinghouse, Wagner Electric, Western Electric.

Q. If I suggested to you that Sangamo bought two point nine million pounds of PCBs from Monsanto in a single year, would that be about correct?

A. Yes. Yes.

Q. Do you know how the 1254 that they received was shipped?

A. In drums.

Q. And which plant it came from?

A. I do not know the plant.

Q. How about the 1242? Do you know how that was shipped?

A. It's my recollection that that -- most of that was in the -- in what we call bulk shipment, and at least some of it was shipped in trucks provided by Sangamo.

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Q. Okay. Do you know where that material was made, whether it was Sauget or Anniston?

A. I do not know.

Q. Is there a difference in the way the product was made at Sauget as compared to Anniston, to your knowledge?

A. Basically, no.

Q. In the mid 1950's at the Monsanto Company, who -- and I'm now asking you not for a person's name but for category of job titles -- was responsible for the control of this PCB waste stream that we talked about earlier that comes from the scrubber operation? Would it be the plant manager or the superintendent?

A. Well, the plant manager is responsible for everything that goes on in the plant. He is, of course, assisted by a team that consists of the superintendent who in turn has supervisors and foremen and chief operators, all of who have a role in making sure that these processes are properly operated and the waste streams are controlled.

Q. Let me go back to the drums of 1254.

A. Uh-huh.

Q. My understanding is that Monsanto put

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certain lables on those drums?

A. Yes.

Q. And I'm going to show you some of those lables later on when we get to the documents, but what was the nature of those lables in general? What was the purpose of them?

A. Certainly to identify the contents, and another is to make known the weight because of different tariff regulations, and, thirdly, to give enough information so that the user of that material handles it properly.

Q. You mention weight. How much does a gallon of PCBs weigh and we can take one 1242 for instance?

A. I don't recall the exact number, but it's about ten pounds or so to the gallon.

Q. Based on -- well, let me rephrase that. From 1955 until about 1970, who at Monsanto was responsible for giving customers information as to either handling or disposal practices with regard to PCBs? Was there a department that would be charged with that duty?

A. The Marketing Department is the prime communicator with customers. On a case-by-case basis, they would of course -- for example, in

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proper safe handling of PCBs, they would involve the Monsanto Medical Department where the appropriate professionals would communicate with each other from Monsanto to the customer.

For example, the doctor may talk to a doctor or industrial hygienist or safety man may talk to a safety man. This is when the subject exceeded the ability of the salesmen, the marketing man, to properly respond.

Q. Based on your educational background and experience regarding industrial chemicals and their disposal, is it fair to say that by the mid 1950's, that it was understood by the chemical industry and industries that were using industrial chemicals that those -- that such chemicals should not be discharged untreated to sewers or natural streams?

A. In the 1950s?

Q. The mid 1950s?

A. The mid 1950s, the state of the understanding by industry was such that for the highly-dangerous materials, for example, cyanide, to pick a dramatic one, they of course had to be extremely careful in discharging it in the sewer. Other chemicals depended on the understanding that

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existed at that time may or may not have been permitted to go down the sewers.

Q. How about PCBs?

A. At that point in time, the mid '50s, PCBs were perceived to be not soluable in water and relatively nontoxic, so they were perceived to be innocuous materials.

Q. So is it your testimony that they could be discharged directly to a stream in the mid '50s?

A. Yes.

Q. Let me ask you this question.

A. Uh-huh.

Q. Would it have been sound practice in the mid 1950s for a capacitor manufacturer such as Sangamo Electric Company, discharge between one and two tons of untreated PCBs to a natural stream per month?

MR. MARION: Are you asking him to assume that?

MR. BONDS: Yes.

A. Yes. That would be considered appropriate, uh-huh.

Q. Did there ever come a time when that would not be considered appropriate?

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A. Yes.

Q. When was that?

A. About late 1969, early 1970.

Q. In your later duties at Monsanto, did they involve the development of any toxicity information regarding PCBs?

A. Yes.

Q. And who was developing that information for Monsanto?

A. It was under the direct management of the Monsanto Medical Department, and the actual testing was conducted by a contract laboratory, industrial biotech laboratories.

Q. Who was in charge of the testing?

A. At the laboratory?

Q. Yes -- no, not at the laboratory. At Monsanto.

A. At Monsanto?

Q. Yes.

A. Elmer Wheeler.

Q. He was head of the Medical Department; is that correct?

A. No. He was manager of Industrial Health I believe was his title.

Q. Was he a doctor?

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A. No.

Q. Did you have occasion -- let's get the time frame down. When did this occur that you were involved with the toxicity information? What time frame?

A. I'm a little confused because I was involved with an understanding of the toxicity of the chemicals when I was still at Anniston --

Q. Okay.

A. -- with my workers and their possible exposures and all, but --

Q. What was -- excuse me. Go ahead. What was your understanding of the toxicity of PCBs in 1965 when you were at Anniston?

A. All right. They were not acute toxins such as the hydrogen cyanide I mentioned earlier or battery acid or chlorine. But if not handled properly, they could cause problems which could be skin problems if absorbed through the skin or allowed to stay on the skin too long or too often.

Also if the fumes were breathed, the individual that got too much again, and it varied from person to person and incident to incident, the effects could be very much like those that one

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would find in a severe chest cold; chest pains, difficulty breathing, irritation of the breathing system. So the primary precautions were don't breathe it, don't get it on your skin, and if we followed those, it was demonstrated that we were doing the right thing.

Q. Did your workers at Anniston wear respirators?

A. On occasion.

Q. And on what occasions would that be?

A. Well, it might happen -- it didn't happen often, but, for example, when there might be a leak in the system and the hot material was seeping out of a bad connection, for example, or a hole in a pipeline or a pump that was leaking, and the fumes got pretty bad and the operator had to stay in there to make sure that the system was appropriately shut down and taken care of, he would put on a respirator for that period of time. Again, it's a judgment call; how long will he be there and what must he do before he can get away. So they did use respirators on occasion.

Q. Do I take it from what you're telling me that the process at the plant in Anniston was a closed process? By that, I mean that the worker

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was not exposed to the PCBs while they were heated, they were in vessels or --

A. There were moments when he could have been exposed, for example, when he's taking a sample and he opens the spigot and the fumes would evolve. Or when he is -- at times this was a practice that he opens the manhole cover with a flashlight, looks to see how things are doing in the reaction vessel. There are other times when he opens the manhole to add the lime, and many times if he didn't add it slowly and carefully, it would billow out. So there were moments when he could have been exposed if he didn't do it carefully.

Q. Did he wear a respirator during those moments?

A. Generally not for the operating steps because they learned quickly that these fumes are irritating. They're not pleasant. So they very carefully go through the steps of sampling or adding chemicals or observing. Usually the respirators were used during the unpredictable emergency situations.

Q. Did the workers have available changes of clothes on their shifts?

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A. Yes.

Q. Did they have available showers?

A. Yes.

Q. What were they made available to them for, the showers and the change of clothes?

A. Well, that was available to all workers in the plant irrespective of the operations they were involved with. It was based on safety but a result of contract negotiations.

Q. With the union?

A. With the union.

Q. But it is your opinion that safety required it in a chemical plant?

A. Yes.

Q. What is your understanding of the safety precautions that would follow at the Sauget Plant?

A. They were the same for all practical purposes.

Q. Did you have any information -- or let me back up a minute. You've described to me the toxicity information that you had in 1965 when you went to Anniston. Did you have that same information or that same knowledge in 1955?

A. 1955? No.

Q. Is that because you were not involved

WATER_PCB-SD0000060768

with PCBs?

A. Yes.

Q. When did you first become aware of that information?

A. Somewhere about 1957 or thereabouts when, as a member of the Maintenance Department, I was involved with the electrician in the plant who on occasion would be working with the electrical equipment that contained PCBs. As a result of that, I had to -- I was aware of the steps that the electrician must take to avoid exposures.

Q. And what were those steps?

A. Again, wear the proper kinds of hand protection, gloves, keep it off your skin.

Q. What sort of gloves? Were they rubber, cotton?

A. Well, they were a PCB-resistant synthetic rubber.

Q. Okay.

A. So my first exposure to warnings of the effects of PCBs occurred about that time.

Q. Who did you get your information from?

A. At that time I got it from two ways. One was reading the literature that is available in the company's equipment when it's purchased.

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But my primary method was really a one-to-one discussion with the plant physician.

Q. And that was whom?

A. Dr. Bersche at that time.

Q. Pershe?

A. Bersche, B-e-r-s-c-h-e, I think he spelled it.

Q. Did Dr. Bersche mention any literature that indicated that PCBs could cause systemic injury in humans?

A. I remember -- yes, he did say don't get too much of that stuff because it will affect your liver. But he also went on to say that he had never seen any of that in that plant.

Q. But it was possible for that to occur; is that correct?

A. As.

Q. If the exposure was over a long enough period of time?

A. Yes.

MR. BONDS: Let's take a break.

(Recess)

(Plaintiff's Deposition Exhibit Number 106 mark'd for identification)

MR. BONDS: Read back the last question

WATER_PCB-SD0000060770

and response.

(The requested portion of the record read by the reporter)

MR. BONDS: Did you learn anything else about PCBs and the toxicity characteristic at that particular time and I believe we were speaking of 1957.

A. No.

Q. Did an electrician that you supervised at that point in time wear any kind of respirators when they were exposed to PCBs and the electrical equipment?

A. No.

Q. Did they have any other safety devices other than the PCB-proof gloves that you mentioned?

A. Oh, they had other safety devices that were common to all operations, such as safety shoes, safety spectacles, hard hats.

Q. But not designed specifically for the handling of PCBs?

A. That's correct.

Q. Just chemicals in general?

A. That is correct.

Q. Did you have an occasion to visit the

WATER_PCB-SD0000060771

Sangamo Plant in Pickens, South Carolina?

A. Yes.

Q. When was that visit?

A. I believe it was June or July, 1970.

Q. Were you familiar before you visited that plant with the use of PCBs in the manufacture of capacitors?

A. Yes.

Q. Why did you visit the plant in Pickens in 1970?

A. It was part of a program where I -- whereby I tried as much as time would permit to visit as many dielectric customer plants as I can.

Q. For what reason?

A. To make certain that the managements at the plants had gotten the messages that we had tried to communicate through the Monsanto field representative and through mailings, and this was primarily to emphasize the new information we'd received regarding the environment and PCBs.

Q. What was the purpose of the prior communications from the plant representatives and mailings?

A. To inform our customers of Monsanto's current understandings -- current at that time --

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of reports relating to PCBs being found in the environment by many laboratories and in wildlife species and what type of PCBs were being identified and the fact that these particular types were present in Monsanto's products, and you, as a customer, should be aware of this and don't let it get into the environment. That was the general message in those letters.

Q. What did you see when you visited the Sangamo Plant with regard to PCBs entering the environment?

A. Oh, I saw what appeared to me to be a typical capacitor operation. There were attempts to capture liquid that had spilled, but eventually it did go into a water system, and as I recall at that time, they had a plan at least underway to construct some -- wait. There were ponds, collection ponds, there that collected this water before it entered any natural systems, creeks and rivers and the like.

Q. Were those similar to the ponds at Anniston?

A. Pretty much so, yes.

Q. Do you know how long they had been in operation when you arrived?

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A. I knew at the time but I don't recall now.

Q. Did you see any baskets -- as I understand it, capacitors are placed into autoclaves or vacuum tanks and impregnated with PCBs and other oils and taken and lifted on a hoist, taken over to another place in the plant and soldered shut. Is that your understanding?

A. Yes, sir.

Q. Did you see any baskets under those -- that -- any trays under those baskets to catch PCBs when you visited?

A. Not at that time, no.

Q. Did you see any sawdust on the oil to soak up any excess oil?

A. I don't remember any sawdust at that plant.

Q. Did you see any system for the recovery of PCBs in the Sangamo Plant other than the drain system that you mentioned that sent the PCBs out to the pond?

A. I don't recall any other.

Q. Did you see drains in the floors of the impregnating units?

A. I thought there were drains. Yes.

WATER_PCB-SD0000060774

Q. Did you ever see people mopping the floor in those units?

A. No.

Q. I believe you had an occasion prior to visiting Sangamo to visit a plant in Bloomington, Indiana, did you not, a Westinghouse Plant?

A. I visited the Westinghouse Plant but I don't know if it was before or after the Sangamo-Pickens visit.

Q. Would there have been a time difference as much as a year between those visits?

A. Oh, no.

Q. So this was kind of a swing through the country?

A. Yes. We tried to cover the southeast and the midwest and the northeast in a close loop.

Q. Do you recall whether or not Westinghouse used sawdust on the floors to absorb any oils that might be spilled on the floors?

A. Yes, I do.

Q. Do you recall whether or not they used drip pans to catch the excess PCBs when they were hoisted from the autoclaves, the capacitors were hoisted?

A. They had drip pans.

WATER_PCB-SD0000060775

Q. Let's shift gears just a minute and go back to your involvement with Mr. Wheeler in the development of toxicity studies. Would it be correct to say that in studies concerning the potential cancer-causing capability of a chemical that animals are regularly used because it would not be proper to test such chemicals on human beings?

A. That's my understanding. Yes.

Q. Would it also be fair to say that as a basic and sound scientific practice, we feed or inject animals with suspected cancer-causing agents and use that data as an indicator of cancer risk to humans?

A. Yes.

Q. Is it also true that governmental agencies make decisions as to whether or not to allow a food product to be sold or a drug to be sold or a chemical to be allowed in the environment on the basis of data from animal studies?

MR. MARION: Talking about that being one of the basis?

MR. BONDS: Yes.

A. That is part of their data base. Yes.

WATER_PCB-SD0000060776

Q. Is it also true that animal studies are the best alternative for testing -- best alternative to testing chemicals on human beings which we would in this country not do?

A. Yes. In my opinion.

Q. Is it also true that by 1971, Monsanto had undertaken studies of the effects of Aroclors 1242, 1254 and 1260 on rats, beagle dogs and chickens?

A. Yes.

Q. Is it also true that the results of those studies in the beagle dogs and rats were that the exposed animals had enlarged livers and the unexposed did not?

A. Yes.

Q. Is it also true that with regard to beagle dogs and rats, that the weight gain of the exposed animals was not as large as those of the unexposed animals?

A. Yes.

Q. In the studies with regard to chickens, is it true that there was a reproductive problem observed at low levels of exposure to Aroclor 1242?

A. Yes.

WATER_PCB-SD0000060777

Q. Is it also true that later studies not necessarily done by Monsanto confirmed those findings?

A. Yes.

Q. Is it also true that the beagle dogs exhibited gastric irritation and their stomachs and intestines were affected by the higher doses of chlorination of PCBs?

A. Yes.

Q. In the mid 1950s, if a customer had a question about the proper disposal of PCBs, who would he ask in Monsanto?

A. The Monsanto field salesman.

Q. Would he have been given information in that regard?

A. Yes.

Q. What would happen if a customer wrote in or asked the field representative about the toxicity of PCBs?

MR. WHITEHEAD: At what time are you talking about?

MR. BONDS: Same time. 1955.

A. Well, typically, the salesman had in his possession a statement regarding the toxicity of the material that had been prepared by Monsanto's

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Medical Department, and in most cases, that would be -- it was found to be sufficient. If the customer required more in the way of medical and toxicology information, the salesman would arrange for someone from Monsanto's Medical Department to respond either in writing or over the telephone.

Q. And would Monsanto make whatever literature they had available available to the customer?

A. Yes.

Q. The literature that they had?

A. Yes.

(Plaintiff's Deposition Exhibit Number 107 thru 162 mark'd for identification)

MR. BONDS: Mr. Papageorge, I have in front of me a small stack of documents the majority of which we had received from Monsanto's attorneys in this case pursuant to a request to produce.

What I want to do is ask you if these various letters, memos, reports, data compilation were kept in the course of regularly conducted business at Monsanto, whether it was Monsanto's regular practice to keep such documents and if the memo or document was made at or near the time of

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the events that are recorded or from information transmitted by a person who would have knowledge of those events. Is that fair enough?

A. Yes.

Q. I don't want to have to repeat those questions to you for every document or we'll be here until next year. So what I'm going to do is hand you the first one and ask you if it meets the criteria of those three statements I've just made, and if it does, if you'll just tell me that.

A. Okay.

Q. That's Plaintiff's Exhibit 1. Would you read that for me, Mr. Papageorge, the Monsanto identifying number on the bottom right-hand corner of that document?

A. The identifying number is WM014248.

Q. Okay. And what is the identifying number on the last page of that document, please?

A. WM014254.

Q. Okay.

A. I don't quite know how to respond other than --

Q. Does it meet the criteria that I indicated? I understand that that document was not prepared by someone with Monsanto and that it

WATER_PCB-SD0000060780

is a study that may have been kept in the files of Monsanto in the regular course of business?

A. It does meet those criteria.

Q. Let me hand you what's been marked as Plaintiff's Exhibit Number 2 and the identifying number is WM016468 through WM016478, which would make this about an eleven-page publication, entitled "Proposed Guide for Maintenance of Transformer Askarel"?

MR. MARION: Is this number 2?

MR. BONDS: Yes. 2. Go ahead and look at it.

A. This document meets the criteria described.

Q. Okay. The next one is a document or a document that's marked "Plasticizers and Resins Monsanto Chemicals," WM035467 through WM035508. That's Plaintiff's Exhibit Number 3.

A. This document meets the criteria.

Q. What is the purpose of this document? Why was it put together and published my Monsanto?

A. It's principal purpose is to share with potential customers ideas on how Monsanto's products as listed could be used to make other products.

WATER_PCB-SD0000060781

Q. So it's primarily something that Monsanto would hand out to customers or send customers and potential customers?

A. Yes.

Q. Now, I'll hand you a document that has been marked as Plaintiff's Exhibit Number 4 and it's entitled "The Proper Handling of Aroclors and Their Mixtures in the Electrical Industry," by Benignus and the identifying numbers are WM034884 through WM034959, and you spell that B-e-n-i-g-n-u-s.

A. This document meets the criteria described earlier.

Q. And what was the purpose for the publication of that document?

A. This is to share with customers of PCBs used in the electrical industry some techniques as to the proper handling.

Q. I hand you what's been marked as Plaintiff's Exhibit Number 5 which is a document entitled "The Proper Handling of Aroclors and Their Mixtures in the Electrical Industry." This has Mr. Benignus' name on it and the date of May 1, 1956, and the identifying number is WM034170 through WM034249.

WATER_PCB-SD0000060782

MR. MARION: That's number 5?

MR. BONDS: 5.

MR. GEDDIE: What was the last page of it?

MR. MARION: 34249.

(Discussion off the record)

A. This document meets the criteria described.

MR. BONDS: Plaintiff's Exhibit 6 is a document entitled "The Proper Handling of Aroclors and Their Mixtures in the Electrical Industry," Benignus, January, 1960. Identifying numbers are WM034607 through WM034713, and this is a hundred-page document.

MR. MARION: Let the record reflect, too, since these are rather bulky documents, Mr. Papageorge is not reading individual pages. He's relying on the fact that they have been copied correctly, they are complete documents.

MR. BONDS: I understand.

A. This document meets the criteria.

Q. This document has been marked as Plaintiff's Exhibit 7, has across the top in large bold type "Aroclors," and then in smaller type down the page, "The Physical Properties and

WATER_PCB-SD0000060783

Suggested Applications," and it is application data number OP-115. Unfortunately the identifying numbers did not Xerox on this copy so I cannot say what they are but it appears to be a twenty-nine-page document. Is there any way to determine the date of that document, Mr. Papageorge?

A. There may well be from the registry number of pamphlets that are listed on these documents. But I personally do not have the reference list.

Q. Okay. Can you tell me what the registry number is you are referring to?

A. On -- in this particular document, on page 27, the lower left-hand corner, there is a number 2-195-03-54-02M-71.

MR. BONDS: Franky, can we get that coding device document so we can date these?

MR. MARION: I can check into it and see what's available.

MR. BONDS: Okay.

A. The document meets the criteria.

Q. Now, I'll hand you what's been marked as Plaintiff's Exhibit 8 entitled "A Historical Summary, PCB Environmental" issued by Papageorge.

WATER_PCB-SD0000060784

The identifying numbers are WM042161 -- oh, excuse me, that should be 042181 through 042187, and this is a six-page document.

A. This document meets the criteria.

Q. Okay. I'll now hand you what's been marked as Plaintiff's Exhibit 9. It's a letter to Mr. D.E. Kavanaugh dated July 6, '70 from you. The identifying number is WM008046A through WM008047A.

A. This document meets the criteria.

(Discussion off the record)

MR. BONDS: I'll now hand you a document marked as Plaintiff's Exhibit Number 10. It's a letter of July 7th, 1970 addressed to Mr. Gene Lewis from you and the beginning number is WM025051A through WM025053A.

A. This document meets the criteria.

Q. I'll now hand you Plaintiff's Exhibit 11 which is a document entitled, "PCB-Pollution Problem" dated -- well, it has a date on it. I think that indicates a meeting, and it's January 21 and 22, 1970. This has no identifying numbers on it but the memoranda appears to be ten pages in length with various attachments and tables affixed to it?

WATER_PCB-SD0000060785

A. This document meets the criteria.

Q. The next document is an October 27th, 1970 internal memo from R.E. Keller to you with the identifying number of WM022827.

MR. GEDDIE: What's the date?

MR. BONDS: October 27th.

A. This document meets the criteria.

Q. Next one is dated June 30th, 1970 and it's a letter from you to Mr. Jack Janson of Sangamo Electric Company. Did I say Plaintiff's Exhibit 13? And there is no identifying number -- there is an identifying number on it but I don't believe it's a Monsanto identifying number.

A. This document meets the criteria.

Q. The next document is a call report dated June 25th, 1970 to Benignus with a copy to you, and it appears that a salesman is the author of the document, an R. Graham?

A. This document meets the criteria.

Q. The next document has been marked as Plaintiff's Exhibit 78 and it is a -- appears to be a list with dates of customers visited with your name under that customer visited. It's two pages with no identifying numbers in the bottom right-hand corner.

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A. This document meets the criteria.

Q. Let me ask you a question about that, Mr. Papageorge. Does this represent a list of all customers that you visited during that period of time?

A. It appears to be a complete list.

Q. Are those all dielectric customers?

A. No.

Q. Which ones on the list are not dielectric customers?

A. For example, the very first one, NCR, that's the carbonless carbon paper.

Q. Okay.

A. There's some disposal companies listed here; Rollins, Pearl and Chemtrol.

Q. What business were they in when you say "disposal company"?

A. Collection of chemical wastes and disposal. I see others here such as Goodrich that are not dielectric.

Q. How would Goodrich have used PCBs?

A. One use I recall is a heat transfer application.

MR. MARION: May I ask you a question? Was this produced by us in the production?

WATER_PCB-SD0000060787

MR. BONDS: No.

MR. MARION: This was not produced by us?

MR. BONDS: No.

MR. MARION: Produced in other litigation?

MR. BONDS: Yes.

Q. Did you visit all of the dielectric users that Monsanto sold dielectric fluids to --

A. No.

Q. -- during this period of time?

A. No.

Q. Okay. Why were the customers that are listed there, the dielectric customers, visited and others not?

A. These represented the larger users and also represented the customers that had influence on locations which I didn't visit.

Q. In other words, one of those customers may have had other plants?

A. Yes.

Q. So your message would have been conveyed by the plant you visited to those additional plants?

A. That was the intent.

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Q. Okay. I show you now what's been marked as Plaintiff's Exhibit Number 79. It's dated 5-20-70. It's another call report and ask you if you can identify that?

A. This meets the criteria.

Q. I show you now what's been marked as Plaintiff's Exhibit 14, which is a memo from you to Mr. Benignus and several other people with a letter attached dated June 16th, 1970 from the South Carolina State Board of Health to Sangamo Electric Company.

MR. GEDDIE: That's number what?

MR. BONDS: 14.

A. This meets the criteria.

Q. I now show you a call report dated 3-11-70 again by Mr. Graham that went to Mr. Benignus and ask you if that meets the criteria?

A. It does meet the criteria.

(Discussion off the record)

MR. BONDS: Next I will show you a document marked Plaintiff's Exhibit 17 that is dated, I believe, April the 20th, 1970. The copy is not very good. It's a letter to Chuck Swinyer from a J.G. Bryant, products specialist, Dielectric Fluids.

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(Discussion off the record)

A. Exhibit 17 meets the criteria.

MR. BONDS: Excuse me?

A. Exhibit 16 meets the criteria.

Q. I now show you a Monsanto letter dated February 18th, 1970 with no addressee from a Donald Olson, director of sales, Functional Fluids Group that has attached to it what appears to be an article from "Chemical Week" as well as some charts which I assume are part of that article.

A. This meets the criteria.

Q. Plaintiff's Exhibit Number 82, a letter from J.C. Hydrick with Sangamo Electric Company to a Harold Bergen, B-e-r-g-e-n, dated January 14th, 1972.

A. It meets the criteria.

Q. The next is a letter dated October the 5th, 1970 from Randall Graham to C.H. Swinyer at Sangamo Electric Company marked as Plaintiff's Exhibit 19.

A. It meets the criteria.

Q. Next is Plaintiff's Exhibit 20. Appears to be a letter from you to Jules Hydrick dated July 17th, 1970 indicating an attachment but the attachment is not with the letter.

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A. This meets the criteria.

Q. Next is Plaintiff's Exhibit 21 dated -- it's a letter dated July 10th, 1970 from you to again Jules Hydrick.

A. It meets the criteria.

Q. Next is Plaintiff's Exhibit 22, which appears to be an internal Monsanto memo dated June 5th, 1970 from Benignus, I believe, to a Mr. H.J. Day.

A. This meets the criteria.

Q. Next is a document which has been marked as Plaintiff's Exhibit 23. It's a February 2nd, 1970 memo to you, appears to be from Mr. Bryant.

A. It meets the criteria.

Q. A call report dated 5-20-70, Plaintiff's Exhibit 24 --

MR. WHITEHEAD: That's a duplicate.

MR. BONDS: That's a duplicate, I believe. 3-11-70 internal memo, that's a duplicate?

MR. WHITEHEAD: Yes.

MR. GEDDIE: Yes.

MR. BONDS: Plaintiff's Exhibit Number 26 is a letter of July 7th, 1970 to Mr. Robert Cochran of Sangamo Electric Company from you.

WATER_PCB-SD0000060791

MR. GEDDIE: What number?

MR. MARION: 26.

A. It meets the criteria.

MR. BONDS: Plaintiff's Exhibit 88 is a handwritten memo. The only date on it is 12/11. I cannot read the signature.

A. It meets the criteria.

Q. Can you date that in any way by the numbers of the product that are listed in the memo?

A. It is signed by Mr. David Wood who succeeded Mr. Benignus who retired in 1974.

Q. So it was sometime after '74?

A. So it was after '74.

Q. Okay.

A. It would suggest it was December of '74.

Q. I hand you now what's been marked as Plaintiff's Exhibit 27 which is another handwritten memo dated 1-20-71, signed, I believe, by Mr. Williams, and it looks as if it was written to a Mr. B.O. Severson, S-e-v-e-r-s-o-n.

A. This meets the criteria.

Q. I hand you a document which has been marked as Plaintiff's Exhibit 28 which has across the top of it "Functional Fluids, Sales

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Information Bulletin Number 62," and it's dated December 1, 1971.

A. This document meets the criteria but does not appear to be complete.

Q. Do you know what's missing?

A. As I recall, there were additional pages to this bulletin.

Q. Plaintiff's Exhibit 29 is an internal memo dated July 24th, 1972 and it appears to be a call report signed by P.G. Benignus.

A. This meets the criteria.

Q. The next document is a letter signed by Howard Bergen on Monsanto stationery dated February 4th, 1972 with no addressee but with an enclosure and has been marked as Plaintiff's Exhibit 30.

A. This meets the criteria.

Q. Plaintiff's Exhibit 31 is an internal memo from a Mr. Hatton to Mr. Shimley dated February 15th, 1973.

A. This meets the criteria.

Q. Plaintiff's Exhibit Number 32 is a document dated August 2nd, 1974 to the file from Mr. Shimley.

A. This meets the criteria.

WATER_PCB-SD0000060793

Q. Plaintiff's Exhibit 33 is a call report. It's got several dates. The date received is 6-6-74, and it appears to be Mr. Cumming, C-u-m-m-i-n-g, Patent with one "T" from Mr. Shimley.

A. This meets the criteria.

Q. Could I see that document again, please, sir?

A. Sure (indicating).

Q. Appears that Plaintiff's Exhibit 34 is a duplicate so I'm going to withdraw it. The next document has been marked as Plaintiff's Exhibit Number 35. It's a May 2nd, 1975 memo to C. Patent from a J.M. Riston, R-i-s-t-o-n.

MR. GEDDIE: What's the date on that?

MR. MARION: 5-2-75.

A. This meets the criteria.

MR. BONDS: The next document is again a call report that's been marked as Plaintiff's Exhibit 36. The date typed is 10-31-75 and it's to Cumming Patent, and it appears to have been written by Mr. Shimley, S-h-i-m-l-e-y.

A. This meets the criteria.

Q. The next document is a letter from Mr. Shimley to Mr. Jess Butner at Sangamo Electric

WATER_PCB-SD0000060794

dated May 5th, 1975. It's been marked as Plaintiff's Exhibit 37.

A. This meets the criteria.

Q. Plaintiff's Exhibit 38 is a July 8th, 1975 letter from Mr. Shimley to Mr. Jess Butner. Is that the same letter?

A. No. It's two months later.

Q. Okay.

A. It meets the criteria.

Q. Plaintiff's Exhibit 39 is an August 13, 1975 letter from Mr. H.R. Ford to Mr. Jess Butner at Sangamo Electric.

A. It meets the criteria.

Q. Plaintiff's Exhibit 40 is an October the 4th, 1976 letter from Mr. R.G. Potter, P-o-t-t-e-r, to Mr. J.C. Hydrick, Sangamo Electric.

A. This meets the criteria.

Q. Plaintiff's Exhibit 41 is a call report dated -- at least the call was -- date of the call was October 19th, 1976 from a Mr. Allie, and I don't know who the addressee on this document is.

A. This meets the criteria.

Q. Plaintiff's Exhibit 42 is an October 22nd, 1976 memo from a Mr. David Wood to Mr. D.

WATER_PCB-SD0000060795

Bishop.

A. This meets the criteria.

Q. Plaintiff's Exhibit 43 is a June 3rd, 1976 letter from Mr. J.A. Allie to Chuck Swinyer at Sangamo Electric Company.

A. It meets the criteria.

Q. Plaintiff's Exhibit 44 is a memo entitled, "The Toxicity of Diphenyl and O-Phenyl-Phenol" by a it looks like F.C. MacIntosh.

MR. MARION: I think that was identified in Mr. Bistline's deposition.

MR. BONDS: We'll withdraw Exhibit Number 44.

MR. GEDDIE: Can I ask a question about Exhibit 44?

MR. BONDS: Yes.

MR. GEDDIE: Is it your contention that Exhibit 44 was at any time in Sangamo's possession?

MR. BONDS: No. My contention it was in Monsanto's possession. I don't know -- I don't have a contention with regard to whether Sangamo had it or not.

MR. GEDDIE: Well, the record certainly

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indicated that you you know we did not.

MR. BONDS: I don't know what records you refer to.

MR. GEDDIE: The ones we've turned over to you.

MR. BONDS: Can you sit here and tell me you turned over everything that was in Sangamo's possession in 1974?

MR. GEDDIE: We made a reasonable search.

MR. BONDS: From '45 to when you turned them over to us?

MR. GEDDIE: I'll make you the assurance we made a good faith effort to research all our files, all of Sangamo's files, and this document doesn't appear anywhere.

MR. BONDS: Gray, I never had a doubt that you made a good faith search of those files. Believe me. You tell me you searched them, I believe that. But you nor I neither one know what happened to all the documents that were contained in all those files for all those years.

Q. Go to a document that I assume is dated with the English style of dates, it has a 30.8.49 on it and it appears to be an interoffice memo,

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Mr. M.N. S-t-r-a-c-h-a-n to Dr. J.W. Barrett, B-a-r-r-e-t-t, and it has been marked as Plaintiff's Exhibit 45.

A. This meets the criteria.

Q. It appears that Plaintiff's Exhibit 46 and Plaintiff's Exhibit 45 are the same so I'll withdraw 46. The next document is a February 8, 1960 document that has been marked as Plaintiff's Exhibit Number 47 and it appears to be a memo from Mr. R. Emmet, E-m-m-e-t, Kelly to Mr. Jack Bonavoglia, B-o-n-a-v-o-g-l-i-a, in New York.

A. This meets the criteria.

Q. The next document has been marked as Plaintiff's Exhibit 48. It is a memo from Jack T. Garrett, G-a-r-r-e-t-t, to Mr. A.T. Hinson, H-i-n-s-o-n, dated March 8, '61.

(Discussion off the record)

A. Exhibit 48 meets the criteria.

MR. BONDS: Now, I show you Plaintiff's Exhibit 49 which is a Monsanto Chemical Company Laboratory Test Report dated -- or the date of the particular product shipped is 1-30-62 and it's signed by O.E. Dolin, D-o-l-i-n.

A. It meets the criteria.

Q. I show you Plaintiff's Exhibit 50 which

WATER_PCB-SD0000060798

is another Laboratory Test Report dated 2-23-62, again signed by Mr. Dolin.

A. It meets the criteria.

Q. Plaintiff's Exhibit 51 is another Laboratory Test Report date shipped 7-10-62, again signed by Mr. Dolin, and there is an attachment to that document that appears to be a telegram or a copy of a telegram.

A. It meets the criteria.

Q. Plaintiff's Exhibit 52 is a January 19th, 1962 letter from Elmer P. Wheeler to Mr. W. -- excuse me, a Mr. H.W. Jackson in Glenview, Illinois, G-l-e-n-v-i-e-w.

A. It meets the criteria.

Q. Plaintiff's Exhibit 80 is an August 29th, 1960 letter from Mr. Jack T. Garrett to a Mr. S. Facini, F-a-c-i-n-i.

A. It meets the criteria.

Q. Next is Plaintiff's Exhibit Number 53 which appears to be a document dated March 20th, 1964. It appears to be page 4 of a thirteen-page booklet of some sort. It has a Monsanto identifying number in this litigation of WM031234.

A. It meets the criteria.

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Q. Plaintiff's Exhibit -- is there any way to identify what publication that particular page is from? Are there any code numbers on there that would identify it?

A. There are no identifying numbers, but the -- it appears that it came out of the multi-page document that proposes that the PCB unit at Anniston be expanded to produce more PCBs.

Q. Are you familiar with the document that it came from?

A. I have seen the document in the past.

MR. BONDS: Franky?

MR. MARION: I'll look into it. I think we produced it all. It's just broken apart.

MR. BONDS: But we can't match it with anything we've got.

MR. MARION: I'll look into it.

MR. BONDS: If you look into it, I'd appreciate it.

Q. Plaintiff's Exhibit 54 is a Monsanto memo dated March 28, '66 from Doloros Sisson, S-i-s-s-o-n, to Mr. Wheeler.

A. It meets the criteria.

Q. Plaintiff's Exhibit 55 is a Monsanto memo dated September 21, 1967 from Mr. Benignus to

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it looks like Gerald Miller, Anniston.

A. It meets the criteria.

Q. Plaintiff's Exhibit 56 is an October 4th, 1967 memo from a Paul N. Hudgens, H-u-d-g-e-n-s, to a Mr. B.S. Strenght and others, and Strenght is S-t-r-e-n-g-h-t.

A. It meets the criteria.

Q. Plaintiff's Exhibit 57 is a March 3rd, 1969 letter on Monsanto letterhead from Mr. Elmer Wheeler but with no addressee.

A. It meets the criteria.

Q. Plaintiff's Exhibit 58 is a Monsanto memo dated April the 11th, '69 that has a string of addressees beginning with Mr. P.G. Benignus.

A. This meets the criteria.

Q. Plaintiff's Exhibit Number 95 is a May 2nd, 1969 memo from a Mr. D.R. Pogue, P-o-g-u-e, to Mr. Bergen and others. It's Plaintiff's Exhibit 95.

A. This meets the criteria.

Q. Does the memo contain a ranking as far as the amount of dielectric fluids sold by Monsanto to certain members of the dielectric industry?

A. Yes.

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Q. Where does Sangamo fall in that ranking?

A. It appears to be fourth.

Q. And who appears to be higher in volume purchased than Sangamo?

A. The General Electric, the New York, Westinghouse in Pennsylvania and Westinghouse in Indiana.

Q. Plaintiff's Exhibit --

MR. WHITEHEAD: Those are not ranked by company, rather those are ranked by plant?

A. Correct.

MR. WHITEHEAD: So companies could result in a higher ranking be characterized like that?

A. Yes.

MR. BONDS: So that basically means that the Sangamo Plant in Pickens was the fourth largest purchaser of all the plants using the dielectric fluid in the United States; is that correct?

A. By plant, yes.

Q. The next is a Monsanto memo dated July 24th, 1969 to Mr. Bergen and others. It's from Mr. J.G. Bryant, B-r-y-a-n-t. It's been marked as Plaintiff's Exhibit 59 and has attachments.

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A. This meets the criteria.

Q. Next document is Plaintiff's Exhibit 60. It's dated December the 11th, '51. It's from an E. Mather, M-a-t-h-e-r, and it appears to be to Mr. P.J.C. Haywood, H-a-y-w-o-o-d.

A. This meets the criteria.

Q. The next document is dated December 17th, '51 from Mr. Mather again to Mr. Haywood.

A. It meets the criteria.

Q. Next is Plaintiff's Exhibit Number 62 dated 4 December, 1952 to a Mr. D.V. I think that's supposed to be N. Hardy, H-a-r-d-y, signed by Mr. appears to be H-a-r-d-e-n, Harden.

A. It meets the criteria.

Q. Next is Plaintiff's Exhibit 81 which is a November 19th, 1956 memo from it looks like Mr. Hedworth, H-e-d-w-o-r-t-h, to Mr. Benignus.

A. It meets the criteria.

Q. Plaintiff's Exhibit 86 is a document dated 10-31-58 and it is entitled "A Standard Analytical Method."

A. It meets the criteria.

Q. What is that?

A. This is a procedure that is given to the laboratory analysts to be followed in determining

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this specific characteristic of PCBs.

MR. GEDDIE: What is the number on that exhibit?

MR. MARION: 86.

MR. BONDS: That would be a Monsanto Laboratory that would run the analysis?

A. Yes.

Q. Internal?

A. Yes.

Q. The next document I have is Plaintiff's Exhibit 63 which again is apparently the English way of writing a date 27-2-54, and it's signed by Mr. Hamer, H-a-m-e-r, and it appears that it went to Mr. -- or Dr. J.W. Barrett, B-a-r-r-e-t-t, in London.

A. This meets the criteria.

MR. BONDS: Why don't we stop here and let's take forty-five minutes for lunch.

MR. GEDDIE: That's fine.

(Lunch Recess)

MR. BONDS: This one is dated December the 17th, 1952. It's been marked as Plaintiff's Exhibit 64 and it is a letter from Dr. Kelly to Mr. looks like D.W. Palmer, P-a-l-m-e-r.

A. This meets the criteria.

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Q. Plaintiff's Exhibit 65 is -- looks like an in-house memo from Monsanto dated January 8th, 1952 and it appears to be a list of literature or bibliography of literature concerning our toxicity as well as I think a discussion of the same.

A. This meets the criteria.

Q. Plaintiff's Exhibit Number 84 is a one-page document entitled, "Handling of Aroclors (Chlorinated Diphenyl)," and it doesn't have any other identifying marks on it. It does have a Whitfield Monsanto number on it which is WM027820.

A. This meets the criteria.

Q. Do you know what that is or where it came from?

A. It appears to be a page out of the brochure which relates to Aroclors.

(Discussion off the record)

MR. BONDS: What I'm going to do is withdraw Exhibit 84 and instead hand you Plaintiff's Exhibit 86.

A. Exhibit 76 meets the -- consists of three separate documents each of which meets the criteria.

Q. Okay. The document on the first page,

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do you know what that is or where it came from?

A. This is a page out of a brochure intended for customers and potential customers in the use of Aroclors.

Q. Do you have any idea of the date those brochures that's taken from?

A. I would suggest that the date might be 1950s or earlier.

Q. Okay. Let me now hand you a document marked Plaintiff's Exhibit 83. It's an internal memo dated August 19, 1959 concerning labeling. It seems to be from a G. Robert -- I can't make out his last name. Could be Sido, S-i-d-o, to a Mr. Sigier, S-i-g-i-e-r.

A. This meets the criteria.

Q. Next I will hand you what's been marked as Plaintiff's Exhibit 66. It appears to be an in-house memo from Mr. Wheeler to Mr. Mather and the date is September 1, 1953.

A. It meets the criteria.

Q. Let me now hand you Plaintiff's Exhibit 67 which appears to be a memo from a Mr. Hamer to a Dr. Barrett dated -- we do have this one already -- February 27th, '54. I'll withdraw 67.

I hand you now a document that has been

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marked Plaintiff's Exhibit 68. It's dated November 14th, 1955. It's a memo from Mr. Garrett to Mr. Patrick, P-a-t-r-i-c-k.

A. It meets the criteria.

Q. Attached to that document is a newspaper clipping which mentions the Environmental Protection Agency.

A. I see it.

Q. I would assume that that's mistakenly attached to that document since I think we all know the Environmental Protection Agency did not exist in 1955.

A. That is correct.

Q. Okay. Now, I will hand you a memorandum which has been marked as Plaintiff's Exhibit 69. It's to Dr. Barrett -- I'm not sure who it's from but it's dated 19 August, 1955. It also appears not to be a complete document. The last page may be missing. Could you read the WM numbers in the lower right-hand corner of those two pages for us?

A. Yes. WM031189, WM031190.

Q. So it appears that 91 is missing?

A. At least 91.

Q. Okay.

A. It does meet the criteria.

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MR. BONDS: If we can locate those, we'll attach them if that meets with everybody's approval.

MR. GEDDIE: That's fine. Let us know when you do it.

MR. BONDS: Yes.

Q. Plaintiff's Exhibit Number 70 is a memo dated March 20th, 1957 from a Mr. Hosmer, H-o-s-m-e-r, to Mr. Dunlap dated March 20, '57.

A. This meets the criteria.

Q. Plaintiff's Exhibit 71 is a memo from Dr. Kelly to a Mr. Edelblut, it appears, E-d-e-l-b-l-u-t, and it's dated October 4th, 1957.

A. It meets the criteria.

Q. Plaintiff's Exhibit 72 is a memo to the Aroclor complaint file dated March 9th, 1958 and signed by Mr. Edelblut.

A. This meets the criteria.

Q. Plaintiff's Exhibit 73 is a December 19, 1958 memo from Mr. Menteer, M-i-n-t-e-e-r, and Dr. Kelly to Mr. B.F. Smith. It's dated December 19th, 1958.

A. It meets the criteria.

Q. Plaintiff's Exhibit 74 is page 65 of

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what appears to be a bulletin on Aroclor 1242.

A. This meets the criteria.

Q. What would that be from, if you know or if you can tell?

A. It is a page out of a multi-page document in which the Aroclors are described, and this particular page is specific to Aroclor 1242 with its properties, typical properties.

Q. Okay. Plaintiff's Exhibit 75 is a one-page document from -- it appears to be from the Chemist Analyst Volume 36, No. 2, 33.

A. It meets the criteria.

Q. Plaintiff's Exhibit 85 is a one-page memo dated October 11, 1937 signed by -- or the name on it indicates it was done by L.A. Watt, W-a-t-t.

A. It meets the criteria.

Q. I show you now what's been marked as Plaintiff's Exhibit 89. It's called "Physical Properties of the Aroclors." It appears to be a Monsanto publication.

MR. GEDDIE: What's the page numbers?

A. WM035075 on the first page and the last page is WM035081. It meets the criteria.

MR. BONDS: Can you identify the date of

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that publication?

A. I cannot identify it specifically. From the appearance of the logo and all on the front page, this is typical of what was used in the '30s and '40s, so it's a very early document.

Q. And it was -- what is the use of the document? What did Monsanto use it for?

A. This is to share with customers and potential customers the characteristics of Aroclors in hopes they can find some use for it and buy it.

Q. Number 90 is a document that is entitled, "The Aroclors, Physical Properties and Suggested Applications." It has a Data P-113 Bulletin Number, and it's -- WM035245 is the first page.

A. This meets the criteria.

Q. Can you give us an idea of what the date of that publication is?

A. I do not have a specific date but it appears to me to be something in the late '40s, early '50's.

Q. And it was used for the same purpose as you indicated prior in the exhibits?

A. It is a successor document to the prior

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exhibit.

Q. Now, let me hand you what's been marked as Plaintiff's Exhibit Number 91 and it appears to be some sort of letter or memorandum. It does not, however, indicate who the author may have been, and it's addressed to gentlemen.

A. Yes. This is -- I recognize the document.

Q. What is it?

A. This is a presentation -- this is a draft of the presentation that was made before the Monsanto top management committee in 1969.

Q. Who made the presentation? Do you know?

A. Yes. There were several presenters, and Mr. Wheeler was the initial spokesman, and it appears from this document that this represents his comments, his contribution.

Q. Were you one of the presenters at that meeting?

A. No.

Q. The date you said would have been '69?

A. Yes.

Q. Okay. The next document that I have is a letter from you to a Charles E. Healey of Lockwood Green Engineers, Incorporated,

WATER_PCB-SD0000060811

Spartanburg, South Carolina dated June 30th, 1970.

A. This meets the criteria.

Q. What exhibit number is on that?

MR. MARION: 92.

A. Exhibit 92.

MR. BONDS: 92. That letter indicates that you forwarded some information to Mr. Healey. Do you recall what it was?

A. Not specifically, but at all tims, I had an accumulation of appropriate PCB literature that I had formed as sort of a packet of material, and on request, I would mail to the requester.

Q. Can you tell me what was in the packet, to the best of your recollection?

A. Well, I recall there was the latest status report on Monsanto's toxicity studies. There were copies of articles that had appeared in the scientific journals on PCBs as well as in the popular press. Depending on the point in time, I would add to that the government reports, the presentations made before the government and so on.

Q. Would you send the type brochures that we had seen on the Aroclors?

WATER_PCB-SD0000060812

A. No. No. The material that I was sending was specifically related to the PCBs and the environment.

Q. Okay. Now, I show you what has been marked as Plaintiff's Exhibit 94 which is a March 16th, 1970 letter from Randy Graham to Mr. C.H. Swinyer, Sangamo Electric Company.

A. This is -- this meets the criteria.

Q. With regard to Exhibit 94, the second paragraph indicates that Mr. Graham is -- he had enclosed a complete set of Aroclor literature requested by Boyce Whitman and others during our meeting. Do you know what that set of literature consisted of?

A. I do not.

Q. Okay. Now, let me hand you what's been marked as Plaintiff's Exhibit 93. It is entitled, "The Proper Handling of Aroclors and Their Mixtures in the Electrical Industry." It has on the bottom of it what looks like to be the card of Randall Graham and it's dated May 1, 1956.

A. This meets the criteria.

Q. Is it possible that that's the complete set that Mr. Graham referred to?

A. No. That -- I don't believe that this

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represents what the previous document referred to.

Q. Finally let me show you what's been marked as Plaintiff's Exhibit 96. It appears to be an excerpt from a Monsanto Technical Bulletin.

A. It meets the criteria.

MR. GEDDIE: What is that?

MR. BONDS: This is a one-page --

MR. MARION: Exhibit 96. No page numbers.

MR. BONDS: You want me to give you the WM?

MR. GEDDIE: Yes.

MR. BONDS: 035079.

MR. GEDDIE: It's what Exhibit Number?

MR. MARION: 96.

MR. BONDS: I understand Mr. Marion showed you this document, which has not been marked yet, and that you were unable to identify it.

A. Yes.

Q. You can't recognize it or you've never seen it before?

A. I have never seen it before.

Q. I'm going to lable it now. Let me hand you a document that's been marked as Plaintiff's

WATER_PCB-SD0000060814

Exhibit 107 and it is -- my understanding it's an Aroclor label and I want to ask you if you can tell me the period of time that it was used, what product it was used on.

A. I do not know the exact time of use except from the logo that appears on this copy, it appears to have been in use in the 1940s. This particular label is designed for samples of Aroclors. The particular Aroclor that was being offered as a sample would have to be designated on the label, along with its lot number. So the label would be modified accordingly before it's affixed on the sample bottle.

Q. What size sample are we talking about?

A. It can vary from a one-pound sample.

Q. Which would be basically --

A. About a pint jar (indicating).

Q. Pint jar. Okay.

A. And many times up to a drum, fifty-five-gallon drum.

Q. If that label appeared on a fifty-five-gallon drum, what size would it be? Would it be the size it is on the exhibit?

A. Yes. As long as it's a sample, it would be designated as a sample as distinguished from a

WATER_PCB-SD0000060815

commercial product.

Q. Okay. Let me show you a document marked Plaintiff's Exhibit 108, 033507, and I'll ask you basically the same questions about that one.

A. This is a copy of a label designed for use with samples of Aroclor. The particular Aroclor is not designated. It would be added when the sample was prepared.

Q. Do you know what period of time that particular label would have been used?

A. This would be 1950s, 1960s.

Q. Do you know whether or not Sangamo ever received such a label?

A. I do not know.

Q. I'll show you what's been marked as Plaintiff's Exhibit 112, number on the bottom is WM033538.

A. This is a copy again of a label designed for samples. This is specific to Aroclor 1242 and was in use during the 1960s.

Q. Now let me show you a label that's been marked Plaintiff's Exhibit Number 114. It's WM033541.

MR. GEDDIE: 113?

MR. BONDS: 14.

WATER_PCB-SD0000060816

A. This label is intended for use on a fifty-five-gallon drum of the product Aroclor 1242 and was used in 1950, 1960.

Q. If Sangamo had received Aroclor 1242 by drum during that time period, would they have received that label?

A. Yes.

Q. I show you what's been marked as Plaintiff's Exhibit 116 and identifying number is WM033543.

A. This is a label specific to Aroclor 1242 and is designed to be used on different size containers where the different weights would have to be entered and is designed for use by someone other than the Monsanto plants who would package and distribute, and this would be -- would have been in use in the late 1950s, 1960s.

Q. Are you saying that one of your customers would have taken this label, placed it on a drum of your product and then shipped it to another customer of theirs, third party?

A. No, I am not.

Q. Okay. What are you saying?

A. For some of the uses to which the Aroclors were sold in the 1950s, 1960s, Monsanto

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used chemical distributors who would receive the PCBs in tank cars and then do their own drum, packaging, and this label would be provided to them to be used where they can put their company name on it.

Q. And resell it?

A. And resell it as wholesale chemical distributors.

Q. Okay. What time frame would that have been used in?

A. Late 1950s, 1960s.

Q. Was there any warning attached to the tank car, itself, during that period of time when the product was received in tank cars?

A. The warnings on tank cars at that time were those required by the Department of Transportation regarding -- which applied to all chemicals in terms of corrosiveness, inflammability and explosiveness. Those are the only warnings that appeared.

Q. So the warning contained in the last exhibit, which is 116, did not appear on tank cars; is that correct?

A. That is correct.

Q. I show you Plaintiff's Exhibit 121,

WATER_PCB-SD0000060818

which is WM033548. Can you identify that?

A. Yes. This is a label for the product Aroclor 1242 to be placed on fifty-five-gallon drums of the material and was in use starting in the middle of 1970.

Q. I show you what's been marked as Plaintiff's Exhibit 129. It is WM033571. I ask you if you can identify that?

A. This is a copy of a label for the product Aroclor 1254 to be used on fifty-five-gallon drums and was in use in the 1950s, 1960s.

Q. Would Sangamo have received that warning on shipments of 1254 in that period of time?

A. In fifty-five-gallon drums, yes.

Q. I show you an exhibit that's been marked as Plaintiff's Exhibit 132 which appears to be two warning lables, one in Spanish and one in English.

A. I have personally never seen this before.

Q. Never seen that one before?

A. No, sir.

Q. It has on it a Monsanto identification number WM033574. Is it your understanding that

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that came from the Monsanto files?

A. Yes.

Q. I show you Plaintiff's Exhibit 135, which has a Monsanto identification number of WM033577 and ask if you can identify that?

A. This is a label for the product Aroclor 1254 to be placed on fifty-five-gallon drums of that product and was in use in about April or May of 1970.

Q. Okay. I show you what's been marked as Plaintiff's Exhibit 142 and the WM number is 033582 and ask if you can identify that?

A. This is a label for a mixture of Monsanto's product Aroclor 1254 which also contains toluene, ten percent of it is toluene, to be placed on five-gallon pails of that mixture.

Q. Who would you sell that particular product to? What type industry would use a mixture of toluene?

A. Oh, it would be different customers who wanted the Aroclor 1254, but it was a little too viscous for their operations and the toluene was added to make it less viscous.

Q. Would that include the dielectrical industry?

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A. Some dielectric applications were interested in that product, yes.

Q. Do you recall which ones?

A. No, I do not.

Q. I show you what's been marked as Plaintiff's Exhibit 152, WM number 033813 and I ask if you can identify that?

A. This is a copy of a supplimentary label which was added to containers of PCB-type products, and it was first used in about 1971.

Q. We previously talked about Plaintiff's Exhibit 129 and I believe you indicated that that was used on barrels of Aroclor 1254, fifty-five-gallon drums; is that correct?

A. That is correct.

Q. Where would that appear on the drum, itself?

A. On the side of the drum normally between the two ridge lines that run on the circumference of the drum, center section.

Q. On the top?

A. On the side and in the center.

Q. Would the bung be near that?

A. The bung is on top of the drum in line with that label (indicating).

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Q. The label, how was it affixed to the drum, itself?

A. It had an adhesive on the back.

Q. So it was a printed label?

A. It was a printed label and you could peel off the protective cover and press the label onto the steel surface.

Q. What color was the label? Do you recall?

A. There were many colors through the years. Most of them were red ink on a white background.

Q. So --

A. But there were some with black ink and red, a mixture of the two.

Q. What color was the drum normally?

A. Up until 1973 or thereabouts, they were black-colored drums.

Q. Is that an accurate size of that particular label?

A. It appears --

Q. A copy of it?

A. It appears to be full size. Yes.

Q. Were they colored and affixed so that they would be noticeable to the human eye?

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A. Yes.

Q. Let me now show you a group of lables that are dated -- well, they're not dated at all but they're Plaintiff's Exhibit 162 and I'll ask if you'll look through them and tell me whether or not you can identify those?

MR. GEDDIE: What are the numbers on those?

MR. BONDS: They don't have a number, Ray. They have numbers at the upper right-hand corner, start with the initials B.M.

(Discussion off the record)

A. What was your question again?

MR. BONDS: Do you recognize those?

A. Yes, I do.

Q. And they are warning lables, various warning lables; is that correct?

A. That is correct.

Q. Can you tell me what the general time frame is that those lables were used in, and if you would just go by page number? I think first page is 3 of 58; is that right?

A. 3 of 58. Page 3 of 58 --

Q. Have you all gotten them?

MR. GEDDIE: No.

WATER_PCB-SD0000060823

MR. BONDS: Don't go. Stop.

(Discussion off the record)

MR. MARION: Go ahead. We can get a copy of it.

MR. BONDS: If you would, go through the stack and read the page number and then if you can tell me the time period that that particular label was used in.

A. I'll try. Page 3 of 58, that was in use in the '40s and '50s. Page 2 of 58 --

Q. Can you tell me which product the one on 3 of 58?

A. Page 3 refers to the broad family chlorinated biphenyl-technic.

Q. What does that mean?

A. That means that the product contained therein is a chlorinated biphenyl of industrial grade as distinguished from high purity.

Q. Okay. And would that label have been attached to shipments of Aroclor 1254 in drums?

A. Yes.

Q. How about Aroclor 1242 in drums?

A. Yes. Okay?

Q. Go ahead.

A. On page 2 of 58, that is a label that

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refers to the Aroclors by that name and was affixed to containers of Aroclors in the 1940s.

Page 5 of 58 appears to be a copy of three versions of the same wording, three different lables, that were in use in the late '50s, early '60s.

Q. Is that the size that the label would have appeared on a fifty-five gallon drum?

A. No. This appears to -- it's either intended for a very small package like a sample bottle or it's a shrunken copy of the original.

Q. How about the first two that you looked at?

A. The first two appear to be actual size.

Q. Okay.

A. Page 7 of 58 is a copy of a label affixed to containers that are filled with Aroclor 1254 and was in use in the latter part of 1950.

Q. And was used on fifty-five gallon drums?

A. It could have been fifty-five gallon drums, the thirty gallon drum or the five gallon pail.

Q. Okay.

A. Page 8 of 58 is a copy of a label for Aroclor 1254 to be used on fifty-five gallon

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drums, and this label was in use in the late 1950s, 1960s.

Q. Let me stop you just a second. Is it your memory that tells you when these lables were used or is there something on the label that tells you that?

A. Both.

Q. Both? What on the label gives you a hint as to the time frame?

A. Well, it's the logo and when it was changed within Monsanto. It's the wording of the phrases, when certain phrases were added I recall.

Q. Okay.

A. 9 of 58 is a copy of a label for Aroclor 1254 to be used by distributors of this product. It's designed to be used on several size packages, the weight is to be added depending on the package size, and there is a space there for the distributor to place his name and address on it, and this label was in use starting in 1970.

10 of 58 is a copy of a label for Aroclor 1254 for use on fifty-five gallon drums, and it was in use in 1970.

11 of 58 is a copy of a label for a PCB that was used as a heat transfer fluid under the

WATER_PCB-SD0000060826

trademark Therminol RF-1 to be placed on fifty-five gallon drums of that material and it appears it's the type of label that would have been in use in 1950, 1960.

Q. Let me just stop you there a second and ask you throughout this case, I have heard Aroclors were used as heat transfer liquids. How is it used as a heat transfer liquid, typically used if you can --

A. Let me try to describe it. The heat transfer systems in which it were used involved those situations where heat as provided by steam isn't enough. The open flame is dangerous so a system is designed where a quantity of PCBs is heated to very high temperatures with flame in one area and this super-heated liquid, which can withstand the heat, is pumped to another area where the heat is used --

Q. And that's a closed system?

A. That's a closed system and the heat from that hot PCB is used to cook varnishes or whatever is necessary. As it cools, it's returned back through a firewall generally where it's reheated and circulated back and forth so it's a way to supply heat to a remote location.

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Q. Where other heat sources are restricted?

A. Or --

Q. Not adequate?

A. Not adequate or would require high pressure steam which in many localities required a licensed boiler operator for the local authorities and so on.

12 of 58 is a copy of a label to be used for heat transfer fluid Therminol FR-1 to be attached to fifty-five gallon drums of that material and was first used in 1970.

13 of 58 is a copy of a label for again Therminol FR-1-1 for placing on fifty-five gallon drums of that material and was in use in the 1950s, 1960s.

19 of 58 is a copy of a label for Therminol FR-1 to be placed on fifty-five gallon drums and was in use in 1971.

15 of 58 is a copy of two orders used to send to the printer to print lables.

Q. All right. I think maybe --

MR. MARION: According to the copy I have, just so we're clear, the following has been omitted.

MR. BONDS: I was going to clear that

WATER_PCB-SD0000060828

up.

MR. MARION: Okay.

MR. BONDS: I have a document that has not been marked --

MR. GEDDIE: Before you start that, was that last collection, did that have a number to it?

MR. MARION: 162.

MR. GEDDIE: The one that is incomplete.

MR. BONDS: I'm going to hand you now a memo that appears to be from Robert Sido to a Mr. Seppala, S-e-p-p-a-l-a, or Dr. -- and I believe this may be the other lables that should have been in that with the group that we just finished in 162.

MR. MARION: While he's looking, the copy I had didn't have some numbers with it.

MR. BONDS: Oh, okay.

MR. MARION: They are number 3 of 58, 2 of 58, 5 of 58, 11 of 58, 12, 13, 19 and 15 --

MR. BONDS: Okay.

MR. MARION: -- of that exhibit.

MR. BONDS: We will get those to you.

A. You want me to pursue this page by page?

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MR. BONDS: First of all, do you recognize the memo as being a record from the Monsanto Company?

A. Yes, I do.

Q. What is that memo?

A. The memo, which is the first page of this collection, is a memo from the labeling manager of Monsanto to a Dr. Sepala, who I don't know the man but I'm just reading from the document here.

Q. Is it dated?

A. It's dated June 19th, 1963.

Q. Okay.

MR. MARION: You want to mark it?

MR. BONDS: Yes. Maybe we'll just mark it or attach it. Make it part of 162 would be the easiest thing.

MR. MARION: Okay.

MR. BONDS: Is that a history of the Monsanto labeling process? Is that what it represents?

A. It appears to be a good summary. I don't know how inclusive it is and whether it covers the full period, but it does go back, as I see it, from '47 to the date of that memo.

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Q. If you would go through it and tell us what you see on each page, what it would have been used for and also whether or not that's the actual size that would have been used?

A. All right. Page 4 of 58 is a copy of a label that appears to be actual size and was affixed to PCB containers in the '30s, '40s and early '50s.

Q. What size containers? Do you know? Would that have been samples or --

A. I would say that this is -- I cannot tell whether this is a reduced copy or whether it's actual size.

Q. Okay.

A. So I cannot tell which container it was designed for.

Q. If it was actual size, would it have been used on fifty-five-gallon drums or thirty-gallon drums?

A. No.

Q. Okay.

A. 6 of 58 is a copy of the environmental statement that was introduced for PCB products beginning in May of 1970. This particular design was used as a supplimentary label along with the

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lables already in use at that time.

1 of 58 is just a title page with the words "Warning Lables."

Q. Okay.

A. 25 of 58 shows copies of several versions of the same message for use with containers of the Aroclors and they appear to be statements that were in use in the '50s and early '60s.

2 of 58 is a transmittal letter from Mr. Whetherly to Mr. Mentear in which he has attached -- and I don't see copies of it -- attached proposed lables for PCBs for Aroclors.

21 of 58, Mr. Mentear in turn writes to Mr. Campbell relaying Mr. Whetherly's previous message.

28 of 58 is a memorandum dated November 11, 1947 from a Mr. Wheelock to Mr. Reeves proposing changes in a label. Copies are not attached.

29 of 58 is a copy of a memorandum from a Mr. Hutchinson to Mr. Benignus dated March 5th, 1956 referring to the shipment of material under the tradename Aroclor along with a designation chlorinated biphenyls seeking Mr. Benignus'

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permission to do so.

Page 30 of 58 is a letter dated January 17th, 1958 from a Mr. Kellogg to Mr. D.T. Mayor, again referring to labeling of Aroclors.

31 of 58 is a memo to the file by Mr. Stewart dated December 19th, 1958 in which he refers to the state laws requiring lables for chlorinated hydrocarbons and refers to Monsanto trademarks Aroclors and Pydrauls.

32 of 58 is a note by Mr. G.R. Sido dated August 20, 1959, no addressee is designated, in which he refers to a previous memorandum to Mr. Sigler, S-i-g-l-e-r, dated August 18th, 1959 and has at the bottom of the page a proposed wording for chlorinated biphenyls-tech.

33 of 58 is a copy of a memorandum from Mr. Sido to Mr. H.W. Anway dated August 18th, 1959 in which Mr. Sido informs Mr. Anway that products containing PCBs with the trade names Pyranol and Inerteen, P-y-r-a-n-o-l, capital P, and capital I-n-e-r-t-e-e-n, Inerteen are to contain the suggested wording.

Q. Are those names, trade names, used by Monsanto customers to resell the same product?

A. They are, to be specific, the Pyranol is

WATER_PCB-SD0000060833

a General Electric trademark. Inerteen is a Westinghouse trademark.

Q. Did Sangamo Electric have a trademark?

A. Not to my knowledge.

34 of 58 is a poor copy of a memo from Mr. Sido to Mr. Sigler and it appears -- if I can make out the light print, it appears to be a copy of -- I take that back. It refers again to the cautionary statement for PCBs.

35 of 58 is a poor copy of an order signed by Mr. H.L. Phillips addressed to the Office Supplies Department, St. Louis, ordering five thousand copies of something. It's hard to read.

36 of 58 is a memorandum dated August 20, 1959 signed by Mr. C.B. Sigler, S-i-g-l-e-r, addressed to G. Robert Sido, telling Mr. Sido that his memorandum that previously was sent had been distributed.

37 of 58 is a copy of a memorandum dated September 1, 1959 authored by G. Robert Sido, addressed to C.B. Sigler. The print is poorly reproduced and I have a hard time reading it.

38 of 58 is a copy of a telecommunications document sent by G. Robert Sido

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to Mr. H.L. Gray at Anniston, Alabama informing him to use the new lables on Pyranols, Inerteens and montars, m-o-n-t-a-r-s.

And 39 of 58 is a copy of a memorandum dated April 7, 1964 signed by G. Robert Sido, addressed to two individuals, one an M. Smid, S-m-i-d, at the WGK Plant and to Mr. H.L. Gray at the Anniston, Alabama Plant. The memorandum summarizes the latest in how to label PCB products.

Number 40 of 58 is a copy of a memorandum dated April 30, 1970 which I signed addressed to Mr. Sido in which I reported to him the number of units of packaged Aroclor products in various warehouses which would require a supplimentary statement to be affixed.

41 of 58 is a memo prepared by G. Robert Sido addressed to the Montgomery Plant to Miss Grace Stites, S-t-i-t-e-s, and to the Anniston Plant, to Mr. M.B. Mullully, M-u-l-l-u-l-l-y. The memorandum is dated April 30, 1970 and in this document Mr. Sido is asking those two individuals to give him an inventory of the material -- to give him a count of the inventory of material in packages in their warehouses that would need

WATER_PCB-SD0000060835

supplimentary lables.

MR. BONDS: Why don't we break a little bit?

(Recess)

MR. BONDS: Do you recognize those?

A. Yes.

Q. Do you understand them?

A. I think I do.

Q. Good.

(Discussion off the record)

MR. BONDS: Why don't you go ahead and mark those as 163.

(Plaintiff's Deposition Exhibit Number 163-165 mark'd for identification)

MR. BONDS: If you would, look at Plaintiff's Exhibit 165.

A. All right.

Q. What is that, Mr. Papageorge?

A. These are copies that appear to cover several years of two different reports.

Q. Okay. What are the reports?

A. One report is a report of sales of the Monsanto product to the customers and it summarizes the sales for the month of that report.

Q. Okay.

WATER_PCB-SD0000060836

A. And for the year-to-date.

Q. Does it indicate the amount of pay on the product sold?

A. Yes.

Q. Where does it indicate that?

A. There are three columns referring to pounds; pounds this month, pounds year-to-date, pounds last year.

Q. Is this a result of a computer program that keeps a running account of the amount of product sold to various customers of the Monsanto Company?

A. Let me think. It certainly is in the later years, and I think computers were in place on the dates shown here, 1959 and '60. Yes.

Q. Am I correct in assuming that that system was designed to keep a thorough and complete count of the amount of pounds? In other words, could I look at that number and feel comfortable that that year-to-date is accurate as far as the amount of that particular product sold to Sangamo Pickens, South Carolina?

A. Yes.

Q. So I don't have to introduce this box of this particular form (indicating)? Can you

WATER_PCB-SD0000060837

identify that?

A. Yes.

Q. What is that?

A. This is a particular -- I don't know what the official -- bill of lading or a document that says a shipment was made and given quantities for so many dollars on a certain date to a certain account, certain ship-to point and the bill to.

Q. And that would -- would that be the underlying data for these summary sheets?

A. Yes.

MR. BONDS: Mark that, too, please.

(Plaintiff's Deposition Exhibit Number 166 mark'd for identification)

MR. BONDS: You mentioned, I believe -- are you finished with the first report?

A. Yes.

Q. What is the second report?

A. The second type of report shows the -- again the material product for which the record is made; the recipient of that product; the customer; and it shows in the first column in thousands of pounds, last year's sales and then there are -- there's a column there for what the salesmen's forecasting for the current year. Then there's a

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column for sales current year, year-to-date. Then there are columns covering January through December in which the amounts sold each of those months is recorded.

Q. The second report, what purpose does it have?

A. It was intended to help the Marketing Department forecast, first of all, how much product they would need of a given type for the coming year and to compare a customer's ordering to previous year ordering to see if he's ordering more or less, and if it indicated a change, the salesman then would make it a point to drop by and talk, why you need more and why are you taking less.

Q. Is there anything else in those sheets that you have not discussed?

A. I don't know of anything else describing the form in the intent of these documents. These particular documents refer to the Aroclors.

Q. Do they refer to the Aroclors by the numbers 1242, 1254?

A. Yes, they do.

Q. Okay. Let me hand you the exhibit back and refer you to Monsanto page identification

WATER_PCB-SD0000060839

number WM042887 on that page, it indicates that there's a capacitor Aroclor 1489 and ask you if you can identify that?

A. There was an Aroclor 1489 developed in late 1975, early 1976. I was not at that time involved with PCBs any longer so I have limited knowledge as to the specifics of that particular Aroclor.

Q. Do you have a general understanding as to how it differed from Aroclor 1242, for instance?

A. Generally. It's my understanding that it had even less chlorine.

Q. Would it have been less chlorine by weight than, say, Aroclor 1016?

A. Yes.

Q. Plaintiff's Exhibit 164 appears to be a sales summary similar to that you just discussed; is that correct?

A. It's similar in format. Yes.

Q. Is it for a different location?

A. It's for a different location, yes.

Q. And what location is that?

A. Springfield, Illinois.

Q. And that's a Sangamo Plant in

WATER_PCB-SD0000060840

Springfield?

A. Yes.

Q. Does it have some Monsanto back-up invoices or bills of lading attached to it?

A. Yes, it does.

Q. Okay. Now I'll show you what's been marked as Plaintiff's Exhibit 163 and ask you if you can identify those documents?

A. These documents are again examples of the same forms referring to Monsanto's product Aroclor 1242 as shipped to Sangamo Electric Company Plant in Marion, Illinois and also Monsanto's product Aroclor 1254 to that same location and also Monsanto's product Pydraul, P-y-d-r-a-u-l, A-200 shipped to that same plant.

Q. What is Pydraul?

A. Pydraul is a trademark for Monsanto's hydraulic fluids that are fire resistant which at one time contained PCBs as one ingredient of many.

Q. When was that one time that it contained PCBs?

A. From about 1950s to early 1971.

Q. What else did it contain other than PCBs?

A. It contained another set of chemicals

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which are broadly described as aryl, a-r-y-l, phosphates. It contained mineral oil, and it contained minute amounts of other ingredients that I was never made privy to that were supposed to enhance their lubricity, stability, antigumming properties as well as the dye to give it a characteristic color.

Q. What percentage of Pydraul was represented by PCBs?

A. It varied from --

MR. MARION: To sales?

MR. BONDS: No. As constituent? What percentage was PCBs of Pydraul as a constituent?

A. I don't recall the specifics but as best I recall, it ranked, depending on the particular formulation, from about fifteen percent to thirty-five percent.

Q. At this point let me bring up something about this exhibit right here, this Exhibit 37. It contains Xeroxed copies of actual Polaroid photographs, as I understand it.

MR. GEDDIE: Yes.

MR. BONDS: We would like to substitute our copies of those photographs that these represent at some point in time.

WATER_PCB-SD0000060842

MR. GEDDIE: That's fine.

MR. BONDS: Earlier today, Mr. Papageorge, I asked you if based on your experience and your education if it was fair to say that by the mid '50s it was understood by chemical -- to the chemical industry and industries that used industrial chemicals, those chemicals should not be discharged untreated to sewers and natural streams, and as I recall your answer, you indicated that that was not true in the mid '50s, 1955 being specifically the date I think I asked you about; is that correct?

A. To my understanding, yes.

Q. I believe I also asked you if it would have been sound practice in the mid '50s for Sangamo Electric to discharge between one and two tons of PCBs per month into a natural stream, and you indicated that that would have been good practice in 1955; is that correct?

MR. MARION: Object to the form. I don't think he used the words "good practice." The record would reflect it.

MR. BONDS: Sound practice?

A. Acceptable practice would be more appropriate.

WATER_PCB-SD0000060843

Q. I think Mr. Marion has pointed out that the word I used in the second question was not correct, and my colleague tells me that I used "appropriate." I think that may be the correct word.

Let me ask you this: Do you recall giving a deposition on June 25th, 1986 in a case of the City of Bloomington, et al. against Westinghouse?

A. Yes.

Q. I want to read to you questions that were asked of you at that deposition and your answers thereto beginning on page 246 of the deposition at line 5.

The question: "Let me ask you something from the standpoint of Monsanto's policy. Did you ever recommend or allow people to dump either liquid or solid PCB contaminated material in local municipal landfills, was that an accepted practice at any time by Monsanto?"

Your answer: "No, but then it was never discussed."

Question: "Wait a minute. Let's go back a minute to -- " I suppose the word should be "the" but it's not in there, sic " -- discussion

WATER_PCB-SD0000060844

in terms of the general industry or specific guidance by Monsanto in terms of the disposal of Aroclors or Askarels. Did Monsanto ever give advice with respect to disposal?"

"At what point in time?"

"At any time -- I mean, prior to 1969 period."

"No."

"Never gave advice?"

Answer was: "No."

"To your knowledge?"

Answer: "That's right."

Question: "Okay. And had it given advice based on what you have known after thirty or forty years in this business would have been sound practice at any time even what was known at that time to pour PCBs down the drain?"

Answer: "No, it would not have been sound practice."

Question: "All right. Would it have been sound practice to contain those liquids; isn't that right?"

Answer: "Just like all industrial chemicals, yes."

Question: "And would it not have been

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sound practice to send industrial chemicals such as PCBs over to the -- " excuse me. I misread that. Let me begin again.

Question: "And it would not have been good sound practice to send industrial chemicals such as PCBs over to the local municipal landfill; isn't that right?"

Answer: "That is true."

"That was true at any state of knowledge with respect to PCBs at any point in time in its manufacture; isn't that right?"

Answer: "That is true."

I'll ask you to take a look at those two pages and tell me if they fairly represent your testimony in that case?

A. That's my testimony.

Q. Okay.

MR. BONDS: Go ahead and mark that.

(Plaintiff's Deposition Exhibit Number 167 mark'd for identification).

MR. BONDS: Let me now refer you to page 31 of that deposition beginning at line 22:

Question: "Let's talk about who was responsible for giving customer warnings as to either handling or disposal practices with regard

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to PCBs from the mid '50s to 1971."

Answer: "Mid '50s, from the mid '50s to the late '60s, the disposal of PCBs was not perceived to require any particular attention other than that given to other industrial chemicals."

Question: "And what were those disposal practices? In other words, was there any instruction given by Monsanto to its customers from the mid '50s to the late '60s as to the disposal of PCBs or industrial chemicals generic?"

Answer: "Nothing in specific to PCBs."

Question: "No? Was there anything with regard to the disposal or handling of industrial chemicals that would thus include PCBs, any instructions that Monsanto gave its customers?"

Answer: "Nothing in writing."

Question: "Did they do anything orally, to your knowledge?"

Answer: "It is difficult to describe. There is an understanding among the chemical industry people that you don't just dump anything anywhere. This is the kind of understanding that is conveyed in discussions informal or even formal

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type when you talk to a customer regarding a potential sale. I wasn't personally present in the room when these discussions were held so I can't speak for the exact words that were exchanged but the state of science and the state of art in the industry at the time as it applied to all chemicals was to be careful with them. That is the message that was generally conveyed, but there is no specific piece of literature or piece of advice that was offered there."

Question: "Was there any instruction given as to whether it was appropriate to pour PCBs down the sewer?"

Answer: "No, no different than sulfuric acid, battery acid. Just understand those things. You don't talk about them specifically."

Question: "So it would be fair to say that to your knowledge there was a general understanding that you don't pour PCBs down the sewer?"

Answer: "Or any other chemical; motor oil, you don't pour down the sewer."

Question: "Was there any understanding with respect to placement of PCBs or other chemicals in landfills?"

WATER_PCB-SD0000060848

Answer: "The understanding was one of put it in a permitted landfill, permitted by local authorities generally at that time."

I ask you to take a look at those pages of those particular lines and tell me whether or not that fairly represents your testimony in that case?

A. This reflects my testimony.

Q. Okay. Let me point out one thing, Mr. Papageorge, and that is I do not have a copy of the sheet you used to make any corrections to this testimony if you did in fact read and sign the deposition. I will be happy, though, for that to be made a part of the record if you are willing to submit it to Mr. Marion.

A. I don't recall having been given the opportunity to read my deposition so no corrections had been made.

MR. BONDS: Would you mark that, please?

MR. GEDDIE: We're going to object to marking it as an exhibit. You already read it.

MR. BONDS: That's fine. You can object.

(Plaintiff's Deposition Exhibit Number

WATER_PCB-SD0000060849

168 mark'd for identification)

MR. BONDS: Mr. Papageorge, do you have any knowledge or information that PCBs cannot cause cancer?

A. Do I have knowledge that PCBs cannot cause cancer?

Q. Either information or knowledge.

A. I don't have any information that says PCBs have been definitely established as causing cancer in any animal except for one study.

Q. Was that done by Dr. Kimbrol?

A. That was done by Dr. Kimbrol.

Q. Is he at the Centers for Disease Controls?

A. Yes.

Q. In Atlanta?

A. In Atlanta.

Q. Let me ask my question again and that is do you have any knowledge or information that PCBs cannot cause cancer?

A. No.

Q. It's my understanding that there came a point in time -- and I believe it was sometime after 1969 -- that Monsanto stopped or ceased the sale of PCBs for hydraulic uses; is that correct?

WATER_PCB-SD0000060850

A. That is correct.

Q. Was that decision made because Monsanto felt that they could not control the possibility of PCBs escaping into the environment if they sold that chemical as a hydraulic?

A. It wasn't so much Monsanto's controlling the loss. It is our --

Q. That your end user could not?

A. The end user could not under the condition of use assure us that he could not control the escape.

Q. When did that decision to cease those sales take place? When was it made?

A. A decision was made in about May of 1970.

Q. When did the sale cease? Do you recall that?

A. Sales were finally terminated in about early '71.

Q. After the sales to hydraulic users ceased in early '71, you continued to sell PCBs to capacitor manufacturers, did you not?

A. Yes.

Q. Am I correct when I say that I assume that Monsanto felt that it was possible for

WATER_PCB-SD0000060851

capacitor manufacturers to control the -- their manufacturing process so that PCBs would not find their way into the environment?

A. That unacceptable levels of PCBs would not find their way into the environment.

Q. What did you consider to be an acceptable level at that point in time?

A. At that point in time, there was no level established. We were striving to find such a level on the strong belief that there must be a level that is acceptable. Monsanto, itself, chose from what it knew of the technology available and the like that ten parts per billion out in rivers and lakes would be an acceptable level.

Q. Okay. Was the trip that you made to visit some of your major dielectric customers, was that trip made so that you could determine whether or not they could control the product to the point that you would find it acceptable from Monsanto's point of view?

A. To a degree, it was a learning experience for me. At the same time, I recognized when we first went out that much had to be done to achieve some low level. So the trip really was intended to communicate in two directions what we

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thought should be done and what our customers believed could be done, and the intent was, at least on my part, to leave the meeting with a degree of -- an acceptable degree of confidence that they were going to strive to get there. That was the purpose of the visit.

Q. What recommendations did you make to Sangamo Electric with regard to their manufacturing process in Pickens after your trip?

A. Sangamo at Pickens was advanced further than many of the other capacitor manufacturers to a point where I felt that they had a running start and --

Q. Was that -- go ahead.

A. My comments amounted to -- and I don't recall the exact words, but keep up the good work and let us know how you're doing.

Q. Was that because they used settling ponds at the time when you arrived?

A. Correct. That's the primary important feature. Yes.

Q. The -- as I understand it, you made recommendations with regard to drip pans to various dielectric users; is that correct?

A. Yes.

WATER_PCB-SD0000060853

Q. Any other recommendations that you made with regard to how to keep this product out of the environment to any of the other capacitor manufacturers?

A. Yes. There were suggestions on care in transferring the material, suggestions regarding maintenance programs that were better than average in terms of controlling leaks.

Q. In backing pumps and all their equipment?

A. Yes. All their equipment. Don't tolerate even a little leak. Repair it right away. I even went so far as making suggestions that they assign these chores to specific people that they could hold responsible.

I also made some suggestions about don't overheat the material any more than you had to and the vapors that do evolve should be contained. Don't just spew them out the stack. Any scrap material, be careful of what you do with it. Those aren't the exact words but that's the essense of what I talked to them about.

Q. Is there anything that you have just indicated you recommended that could not have been done on a technological point of view in 1955?

WATER_PCB-SD0000060854

A. I don't know of anything that I suggested there that was impractical in a factory.

Q. That's both from a technological and economical point of view?

A. Yes.

Q. Let me ask you a question, Mr. Papageorge. If PCBs were mixed with a drinking water supply, isn't it true that an activated charcoal filtration system would remove the vast majority of PCBs?

A. It would do it in a laboratory test. Yes.

Q. Do you know whether it would do it in the real world?

A. I looked into that very thoroughly with individuals who are in the activated carbon water treatment business, and in no instance with any of them, in essence, guarantee the results that we were looking for. So in a real-world situation, I am left with the understanding it couldn't be done, and this is why it wasn't done anywhere, to my knowledge.

Q. To run it through activated charcoal?

A. It depends on the amount of contamination initially.

WATER_PCB-SD0000060855

Q. Let's say it was initially two hundred parts. What's the soluablity of 1242 in water?

A. Well, it's about two hundred parts per billion in room temperature in distilled water. I have never seen a number in the real world.

Q. What would charcoal filtration do to that in a water treatment plant intended for potable water?

A. I wish I could remember some numbers.

Q. Cut it by a factor of ten.

A. I don't think that any of the numbers I saw would take it below about twenty parts per billion, somewhere in there.

Q. So it would cut it from -- cut it a hundred eighty parts per billion?

A. It's a factor of a tenth.

Q. Was charcoal filtration available in the mid 1960s, activated charcoal filtration?

A. I don't know.

Q. Okay. Do you know how many other customers you sold PCBs to in South Carolina in the period from 1956 to 1970?

A. I do not know.

Q. Do you know whether any of them -- did you have other customers in South Carolina?

WATER_PCB-SD0000060856

Obviously you had some.

A. I don't recall specifically, but the sale of the PCBs was so wide spread, the likelihood that users of PCBs existed in South Carolina is good.

Q. Do you recall a plant in Florence, South Carolina called Electromotive Company?

A. I do not.

MR. BONDS: That's all I have.

CROSS EXAMINATION

QUESTIONS BY MR. GEDDIE:

Q. Mr. Papageorge, my name is Gray Geddie. I represent Sangamo in this case and I have a few questions that I would like to ask you on behalf of Sangamo-Weston. Mr. Bonds asked you a number of questions about warning lables that were shipped at various times from Monsanto to its customers. Do you recall that testimony?

A. Yes.

Q. You also testified that you visited the plant, the Sangamo Plant, in June of 1970.

A. Yes.

Q. Did you take a tour or an inspection of the plant at that time?

A. Yes.

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Q. Did your inspection reveal any situations that were not in conformance with the language of the warning lables that you had sent to Sangamo over the years?

A. I didn't see anything that violated the precautionary statements. No.

Q. All right. During this round of tours for Sangamo and other companies, I believe there's an exhibit that refers to some twenty, twenty-five companies that you visited, was Sangamo a good company? Did it stack up well against the other companies in the industry or how would you compare them?

MR. BONDS: From what perspective, money making or making capacitors or --

MR. GEDDIE: I'm talking about his inspection and the items that he was looking for during his inspection.

A. Regarding the kinds of things I was interested in specifically at the time, as I recall, the Sangamo side was if not the best, one of the best I saw in terms of progress of achieving the kinds of things we were looking at at the time.

Q. Had Mr. Randy Graham visited the plant

WATER_PCB-SD0000060858

prior to your visit in June of 1970?

A. Yes.

Q. Did he file a report with you concerning that visit?

A. I believe -- yes, I believe I recall a trip report.

Q. Bear with me a moment and we'll find it. I'd like to refer you to Plaintiff's Exhibit 79, and if I may, I would like to read from that and see if this conforms with your inspection.

"Without a doubt, Sangamo should be in the best position in the capacitor industry regarding the pollution ecology question in proper disposal of scrap material. Their new system could be featured in the Monsanto magazine as an example for all to follow. The settling lakes are quite beautifully landscaped."

Do you recall that?

A. Yes, I do.

Q. Do you recall discussing the new treatment facility at Sangamo with Mr. Graham prior to your visit?

A. Yes. Yes.

Q. Did you go on a tour of that treatment system when you visited the plant in 1970?

WATER_PCB-SD0000060859

A. Yes.

Q. In your opinion, was that treatment the state -- was that treatment system the state of the art as far as treatment systems was concerned in 1970?

A. Yes.

Q. Did you believe that that treatment system would reduce the PCB effluent discharge to acceptable levels?

A. Yes.

Q. Now, when you went through the plant in 1970, June of 1970, I believe you met with Mr. Hydrick and a group of other Sangamo officials?

A. Is that a question? Yes.

Q. Do you remember that?

A. Yes.

Q. I believe that was in Mr. Hydrick's office?

A. It was quite a group of people, and I don't recall if it was a conference room or office.

Q. What did you talk about in that meeting?

A. The -- I started most of the dialogue by reviewing with the group my understanding of the PCB environmental issue as of June of 1970 and

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reviewed with the audience, with the group there, what I had heard from regulatory people, what I had heard from Academia, our recent visit with the European customers and European competitive producers and investigators, researchers and governmental people Europe.

I reviewed with them the status of the animal studies that Monsanto was sponsoring, and also told them that our management had decided to stay with the dielectric application and withdraw from all other uses which we thought would lead to environmental contamination.

Q. Did you discuss with Sangamo officials at that time any human health concerns regarding the use of PCBs?

A. Well, yes. I don't recall the exact words but that did come up, and I discussed with them Monsanto's thirty, forty years experience, not only with its own people but with inputs from its customers of all kinds, not just dielectric, all those -- thousands, and the conclusion that I left them with is that the materials, if properly used with respect -- and that doesn't necessarily involve extremes -- should not lead to any health problems.

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Q. All right. What was the reaction of the Sangamo officials to your presentation?

A. Well, I personally felt that they were a very attentive audience. I sensed many of them were taking notes, and I walked out of that meeting with a pretty good feeling that they were getting the message and were going to do something.

Q. Now, there was some discussion about your letter following that meeting to Mr. Bob Cochran of Sangamo, and it was dated July the 7th, I believe, of 1970. Was a similar letter written to other companies suggesting steps to be taken?

A. For many of them. Not all of them.

Q. Did Sangamo follow-up on the recommendations that you made in your letter?

A. As best I could tell. Yes.

Q. Now, you mentioned in your direct examination an inspection of the Westinghouse Plant in Bloomington, Indiana in response to Mr. Bonds' questions, and he specifically asked you about the use of drip pans in the Westinghouse facility. Do you recall those questions and answers?

A. I believe I do. I recall the reference

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to drip pans and to Westinghouse Plant. Yes.

Q. Were there, in fact, drip pans in place at the Westinghouse Plant?

A. I saw drip pans. But they were not aligned under the equipment so the drips were not being trapped. I also saw the drip pans system. What little it did collect would dump it out on the floor eventually at the end of the system so it was a good intention that had not been properly maintained is what I saw.

Q. All right. At the Westinghouse Plant in Bloomington, was there a treatment system similar to what existed at Sangamo?

A. No.

Q. What happened to the effluent or the waste water from that plant?

A. As I understand it, it entered the municipal sewage system.

Q. Mr. Papageorge, what was the approximate sales volume per year of PCBs prior to 1970?

A. Through the years, it was increasing. I don't recall the exact number, but I do know that in 1970, just before sales were limited, it had reached eighty million pounds a year for all uses, roughly. That's not the exact number.

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Q. I understand. Of the eighty million pounds, approximately what percentage of that was designated for dielectric fluids?

A. About half.

Q. Would that mean then that the remaining half would be for open-ended type uses?

A. Yes.

Q. And these were the uses that we've heard about, paints, inks, carbon paper, things of that nature?

A. Yes. But also there was a use that we thought initially we could classify as closed. This is the heat transfer application. Some of those pounds went into that. But after some unfortunate accidents, we also eliminated that service, that use so the half of the PCBs that found their way into the environment included heat transfer as well.

Q. All right. Now, following Monsanto's voluntary action to curtail sales in 1970, what happened to the sales volume?

A. It dropped by a half. We shut down the one plant.

Q. All right. And that was the Anniston Plant?

WATER_PCB-SD0000060864

A. Yes, sir.

Q. Are you aware that the plaintiffs in this case do not claim injuries as a result of occupational exposure?

A. That's my understanding.

Q. All right. Is it your general impression that exposure to PCBs are higher in the occupational setting or in the environmental setting?

A. Oh, it's my impression that it's the industrial setting.

Q. All right. So it would be a fair statement then to say that a person who worked around PCBs would be exposed to much greater quantities than someone in the natural course of living fifteen miles downstream?

A. Yes.

Q. Are you familiar with Dr. William R. Gaffey?

A. Yes.

Q. Who's Mr. Gaffey -- or Dr. Gaffey?

A. Dr. Gaffey is an epidemiologist that works for Monsanto.

Q. Let me show you -- I'll need to have that marked, too, please.

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MR. GEDDIE: Mark that as Sangamo Defendant's Exhibit 1.

(Sangamo Deposition Exhibit Number 1 mark'd for identification)

MR. GEDDIE: Do you recognize that epidemiological study, sir?

A. I've seen it before, yes.

Q. I believe the date is 1981?

A. Yes.

Q. Does that study purport to assess the exposure and any clinical illnesses that resulted from occupational exposure from PCB?

A. Yes.

Q. What was the conclusion -- did it purport to assemble the literature and review all of the available studies at that time?

A. Yes.

Q. What was the conclusion of Dr. Gaffey with regard to clinical illness resulting from PCB exposure?

A. Well, there was no clinical illness associated the with level and duration of exposure to PCBs.

Q. All right. Now, Mr. Bonds asked you some questions about studies that proved the

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presence or absence of cancer, and I believe you responded that there was one study by Dr. Kimbrow that suggested the possibility of cancer in animals, rats, I believe?

A. Yes.

Q. Would it be a fair statement to say that -- excuse me. Have a number of other studies been conducted that did not show a connection between PCB exposure and cancer?

A. Yes. I have in mind particularly the National Cancer Institute study reported in the late seventies in which they found no cancer under the conditions of the study.

Q. Would the action of studies showing a correlation between PCB exposure and cancer suggest to you that exposure to PCBs do not cause cancer?

A. That would be a strong suggestion. Yes.

Q. Is that your professional belief?

A. That's -- yes.

Q. Mr. Bonds asked you a number of questions about an activated carbon filtration system and suggested that a number could be reduced from two hundred parts per billion to twenty parts per billion by the use of that

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method.

If rather than two hundred parts per billion were introduced into the carbon filtration system, let's suggest that twenty-five parts per billion were suggested or introduced into that system, would it reduce it any lower than twenty parts per billion?

A. I don't believe so.

Q. Now, Mr. Randy Graham was your sales representative that called on the Sangamo Plant on a regular basis?

A. He was one of them.

Q. Yes. Was he the primary person?

A. At that point in time. There was only one person at a time, but Mr. Graham was replaced later.

Q. What was Mr. Graham's educational background?

A. Mr. Graham was a chemist by schooling, had worked at the Anniston Plant, and then entered the sales team.

Q. Was he knowledgeable in the area of PCBs?

A. Yes. He had helped manufacture them.

Q. When he visited the plant, would he make

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reports to you as to his findings every time he came to the Sangamo Plant, oral or written?

A. It's only after 1970 when I was assigned the PCB job that I would be communicating with Mr. Graham on a fairly regular basis, yes. Prior to that, no.

Q. Okay. Are you familiar with what has become known as the Yusho incident in Japan?

A. Yes, sir.

Q. What was that incident?

A. As I understand it, talking with members of the Food and Drug Administration and with Monsanto's representatives in Japan, there was a rice oil process in Japan which used PCBs in a heat transfer system that we discussed earlier today to heat the rice to the right temperatures.

The system developed a leak such that the PCBs, which were manufactured by a Japanese company, not Monsanto Japan, but Kane Fuchi, K-a-n-e F-u-c-h-i -- I think that's correct -- Kane Fuchi Company, that PCB got into the rice oil contaminating it, and I understand it was determined to be as high as two thousand parts per million of these PCBs in the rice oil.

The rice oil was bottled and sold to

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consumers who used it in their home cooking. Thousands of people ingested it and the reports came back that many of these people suffered a variety of symptoms; headache, nausea, loss of appetite, loss of weight. There was some newborn infants that were the term used was pigmented; they were darker in color than the normal child. But after a few months, that apparently cleared up.

There was a lot of acne noted. I don't recall the other symptoms but it was -- that's the best of my recollection on the incident.

Q. All right. This happened roughly in 1968?

A. Yes.

Q. Have there been later analyses done of that incident?

A. There were numerous studies made by the Japanese University people and also Dr. Herbert Blumenthal from the U.S. Food and Drug Administration made a personal visit to Japan and he told me that his considered opinion was that the PCBs weren't the cause but there was very strong suspicion that it was the chlorinated dibenzofurans in the oil.

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Q. Now, in 1970, Monsanto's Aroclor was analyzed for PCDFs, the dibenzofurans, by Monsanto's chemists?

A. Yes.

Q. And the results were -- and I'm just trying to speed things up -- were that they were not present, none detectable?

A. That is correct.

Q. Was a similar evaluation done by an independent laboratory in Europe?

A. Yes.

Q. And who was the person that conducted that test?

A. A Dr. Voss, V-o-s-s, University of "Utreck" in the Netherlands, had analyzed PCBs manufactured by the German companies, the French, the Italian and by Monsanto's United Kingdom Plant, the plant in Wales. He found chlorinated dibenzofurans in all samples except the Monsanto-produced material.

Q. All right. Did he examine the Japanese variety?

A. Not at that time. No.

Q. As a manufacturer of PCBs since roughly the early 1930s, has Monsanto ever had a workman's

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compensation claim filed by an employee claiming some physical injury due to PCB exposure?

A. I'm not aware of any.

Q. In your testimony in response to Mr. Bonds' questions, he used a previous -- some testimony in an earlier case regarding sound or unsound practices in the Bloomington Plant of Westinghouse?

A. Yes.

Q. Would you care to explain your answer further insofar as the Bloomington situation is concerned?

A. I would like to because I get the impression we may be talking about two different kinds of disposal.

Q. Make that clear, please.

A. I'll try. When I talk about disposal of chemicals into waterways, sewer systems, I have an image of a tank full of chemical waste and someone opens a spigot and allows the material to dribble on down the sewer and into the waterways as distinguished from water that enters the sewers that has been contaminated in its use through a plant.

So in my mind, disposing of waste in a

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sewer is different from water which contains lesser amounts of these chemicals.

Q. Okay. Now, in the early 1970s, did Monsanto embark upon a research effort to develop an alternative to PCB fluids?

A. Yes.

Q. Did Sangamo have independent research facilities at its plant?

A. I don't know.

Q. All right. Did Monsanto develop a non-PCB alternative to dielectric fluid?

A. No.

Q. Were there difficulties in finding an alternative?

A. Extreme difficulties.

Q. What were they?

A. The principal one was the fire resistance coupled with good electrical properties, and the fire resistance appeared to be associated with persistence in the environment. It didn't appear that you could have one without the other. As a result, we just failed to find an acceptable replacement with the same kinds of properties.

Q. Are you familiar with the

WATER_PCB-SD0000060873

epidemiological studies that were conducted on the employees of the General Electric Company in New York?

A. Yes. Yes.

Q. What were the conclusions -- that was done by physicians at Mount Sinai Hospital?

A. Yes.

Q. Dr. Sellakoff, I believe, headed that?

A. Yes.

Q. What was the conclusion of the Mount Sinai medical team, if you will, of the results of PCB exposure over a long period of time by G.E. employees?

A. As I recall, they found no evidence which could relate a health effect to that exposure.

Q. Is that similar or the same to Monsanto's experience over the years?

A. Yes.

Q. In 1974, on September 23rd, 1974, did Monsanto sponsor a dielectric symposium here in St. Louis?

A. Yes.

MR. GEDDIE: Mark that as number 2, please.

WATER_PCB-SD0000060874

(Sangamo Deposition Exhibit Number 2 mark'd for identification)

MR. GEDDIE: Were you a participant on that program?

A. Yes, I was.

Q. Was the program well attended?

A. Yes.

Q. Was there a discussion in that program of the control of PCB in a capacitor-production facility?

A. Yes.

Q. Who was the speaker that addressed that particular subject?

A. It was a member of the Sangamo Company.

Q. Was his name Mr. Jess Butner?

A. Yes.

Q. How was Mr. Butner selected to appear on this seminar program?

A. Well, he represented to Monsanto a member of a company that had done -- gone the furtherest in meeting the industry objective. So we thought he would be the most appropriate to make comments to the group.

MR. GEDDIE: Can we take a couple minute break?

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(Recess)

MR. GEDDIE: Mr. Papageorge, Mr. Bonds in his questions to you earlier in referring to animal studies suggested that the best way to evaluate the health effects of an established chemical was through animal studies. Do you recall that?

A. Yes, I do.

Q. In fact, sir, what is the most effective or the best evidence of the effects of an established chemical on human beings?

A. Oh, for an established chemical?

Q. Such as PCBs.

A. I would suggest that experience with the work force through the many years would give the best evidence whether there's a serious problem regarding health effects.

Q. Has Monsanto's experience since 1930 shown a correlation between PCB exposure and cancer of any type?

A. No.

Q. Now, in your opinion, sir, as a manufacturer of PCBs, was Sangamo a responsible company when it came to environmental concerns?

A. Very much so. Yes.

WATER_PCB-SD0000060876

Q. You've already established that they were one of the top companies, if not the top company in 1970?

A. That is correct.

Q. Did Sangamo comply immediately with your directives or suggestions for improvements?

A. Yes.

Q. Did Mr. Graham or your other sales representatives ever report anything unfavorable regarding Sangamo back to you?

A. No. It was the other way. They reported very favorable progress and added attitudes and actions.

Q. Did Sangamo respond immediately to problems that were brought to their attention by Monsanto or anyone else?

A. Yes.

Q. Was Sangamo's management concerned with doing the right thing as far as environmental controls were concerned?

A. They were.

Q. In 1970, was the discharge of PCBs and waste water an acceptable practice?

A. Depends on the amount.

Q. I understand, sir. Was it -- as a

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general practice, was it an acceptable practice to have PCBs in the waste water?

A. Yes.

Q. And in fact was that the standard in the industry?

A. Yes.

Q. Was it proper practice in 1970 to dispose of PCBs in approved landfills?

A. Yes.

Q. PCB scrap?

A. Yes.

Q. When Monsanto offered incineration of scrap waste, did Sangamo take advantage of that opportunity?

A. Yes. Immediately.

Q. When a PCB -- when reduced chlorines, 1016, became available, did Sangamo purchase the reduced chemical?

A. Yes.

Q. Was it a sound alternative to 1242 at that time?

A. Oh, yes.

Q. Did Sangamo participate in trade organizations and stay abreast, to your knowledge, of the developments in the early 1970s?

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A. They were very active. Yes.

Q. Did Sangamo make a positive contribution towards environmental control of PCBs in the 1970s?

A. Yes.

MR. GEDDIE: That's all I have. Thank you, sir.

MR. MARION: I don't have any questions.

REDIRECT EXAMINATION

QUESTIONS BY MR. BONDS:

Q. Mr. Papageorge, have you conferred with Mr. Geddie about your testimony today prior to today?

A. Yes.

Q. Have you conferred with him at a break today?

A. Yes.

Q. The last break we took?

A. Yes.

Q. I ask you a question and I somewhat want to clarify one thing -- maybe it will clarify a lot of things -- about a question I asked you earlier today and that was the question I asked you regarding the state of the art, and I'm going to ask you the same question now that I'm going to

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ask you at some different time, if I can find my question.

You indicated just a minute ago in Mr. Geddic's examination that the amount of the PCBs that were allowed to escape in waste water would make a difference as to whether you would consider it sound practice in 1970; is that correct?

A. In 1970.

Q. That's what he asked you, I believe.

A. Yes. Yes.

Q. Okay. Let me ask you if the amount of the PCBs allowed to escape in the waste water, exclusive of the weight of the water, amounted to one to two tons per month, would you find that an acceptable practice into a natural stream?

A. I wouldn't know how to measure the acceptability of such a concentration not knowing the size of the water body, the eventual destination, the creatures living in this water, the use to which the water is put.

Q. Let me give you a set of assumptions in that regard. I want you to assume that the waste water discharge enters a very small creek -- and by "small," I mean it's probably immediate flow of ten feet wide at most a foot deep -- it then runs

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into a river that's approximately forty feet wide and probably some two to three feet deep. It travels approximately eighteen miles downstream where the water then is damed in two places. Human beings swim in those areas of the dams. They eat fish from those areas --

A. Uh-huh.

Q. -- would you consider that an acceptable practice?

A. I don't have enough information to make a judgment.

Q. What other information would you need, Mr. Papageorge?

A. How much would the average person ingest or absorb or whatever it takes to get it into his person, how much of the PCBs are trapped and tied up that are immobilized, what kinds of PCBs are available, what bacteria are there to take any action on these. I just don't have enough information and I doubt if anybody has.

Q. Let me ask you this question. Assuming the size of those bodies of water, if that conduct continued from 1956 through 1970 -- and I will represent to you that on the average, five thousand pounds per month of PCBs were placed in

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those two streams -- would that give you any cause for concern in the same human uses?

A. There again, the first five thousand may be as effective as the next million. I don't know what equalibrium conditions are set up.

Q. So that wouldn't give you any cause for concern under the facts I've given you?

A. That's correct.

Q. Mr. Geddie asked you about the call report with regard to your June, 1970 visit to Sangamo and that you had made the statement that Sangamo I think is one of the best in the industry, as I recall?

A. That's right.

Q. Again I will ask you is that because they had installed settling ponds to allow PCBs to settle out of the discharge before going into the environment?

A. That was an important feature of their approach, yes.

Q. What other features of their approach caused you to make that statement?

A. Well, they were careful of how they used the -- handled the PCBs in their plant in the first place. So that reduced the amount that

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would get away from them. Then they had the ponds to trap what did get away from them.

Q. What did you see that lead you to make the statement that they were careful with regard to the PCBs in the plant at your visit?

A. I did not see the oily conditions that I witnessed in other capacitor plants.

Q. Okay. That's your answer?

A. That's a big symptom.

Q. Did you ever go back to Sangamo after the June, 1970 visit?

A. No.

Q. With regard to the questions concerning the difference between occupational and industrial exposure, is it your testimony that Monsanto workers who worked with PCBs were highly exposed to that chemical during their work hours?

A. I would suggest that in the earlier days, in the '40s and so on, the exposure could be properly defined as highly. As time went on, that exposure was reduced.

Q. Substantially reduced?

A. Yes.

Q. Let me ask you if you recall an incident in which five employees of either the Swan

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Chemical Company or the Monsanto Company actually sued Monsanto for exposure to chlorinated diphenyl and received an average of about five thousand dollars in awards sometime in the late '30s -- late '20s early '30s?

MR. WHITEHEAD: Do I hear some hearsay?

MR. BONDS: That's all I've been hearing.

Q. Do you recall anything about that incident?

A. There was an incident associated with a solid-type PCB, not a liquid.

Q. Would you consider that the equivalent to a Workmen's Comp claim?

A. Not knowing the circumstances, I don't know how to evaluate that.

Q. Further ask you with regard to industrial versus occupational -- occupational versus environmental exposure, would the nature of Aroclor 1242 change in nature over time?

A. There is some evidence that some of the PCBs in that mixture --

Q. Some of the isomers?

A. -- some of the isomers would disappear with time, would not be detectable.

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Q. So that the remaining isomers would be in greater concentration per unit per PCB in the environment?

A. It would have the characteristic of something like an Aroclor 1254.

Q. This is completely off the subject but is Dr. Keller still alive?

A. Yes.

Q. Do you know where he lives?

A. In the St. Louis area.

Q. Would you characterize --

MR. WHITEHEAD: Dr. Keller you said?

MR. BONDS: Keller, K-e-l-l-e-r.

Q. Do you -- does he still work for Monsanto?

A. No. He retired.

Q. How do you characterize the Yusho incident and the exposure that was -- that it was the result of acute or chronic?

A. From what I understand of the symptoms, some of them would fall in the acute category that with time disappeared. As I understand it, there is still some individuals that exhibit symptoms that could be described as chronic.

Q. What I'm referring to is their exposure,

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was that chronic or acute?

A. I would call that an acute exposure, short-term high level.

Q. If Aroclors are placed in a river that contains fish in substantial quantities, will the fish uptake the chemical in the feeding process if they're bottom-feeding fish?

A. Yes.

Q. Will the chemical accumulate in fish flesh?

A. Yes.

Q. If -- and I want you to assume PCBs are in fact harmful to human beings. I want you to make that assumption whether you agree with it or not. Okay?

A. I'll try.

Q. And you were to be exposed to it, would you rather be exposed to twenty-five parts per billion or twenty parts per billion?

A. I don't think it makes a significance difference.

Q. If I told you -- and again I want you to assume that in 1961 in that year on at least five occasions a tank of Aroclor 1242 that contained six hundred gallons or approximately six hundred

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gallons was released to the sewers at Sangamo which ran into the creek adjoining Sangamo, would you consider that acceptable practice?

A. I'd be disturbed by that.

Q. Thank you. Regarding Mr. Geddie's question about Sangamo taking advantage of 1016 when it became available, is it my understanding that Monsanto would not sell 1242 for their purposes after 1016 became available?

A. That is true.

Q. With regard to their shipping product back to Monsanto, is it true that on several occasions, they would criticize for the sloppy manner in which their shipments were received at Monsanto?

A. Yes.

Q. The barrels were leaking?

A. There was evidence of leakage, yes.

Q. Do you recall what year that was?

A. '74, somewhere in there, '75.

Q. Had they received considerable information regarding the danger of allowing PCBs to escape into the environment by that date from you and other sources?

A. Yes.

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Q. You mentioned while ago that a test was run to determine whether or not poly chlorinated dibenzofurans were present in Monsanto's Aroclor; is that correct?

A. That is correct.

Q. And you indicated that it was not found; is that correct?

A. At what point in time?

Q. Well, you pick a time and tell me whether it was found or not. I thought you said the only time it had been tested but I'm not sure.

A. In early 1970, tests were made. No PCBs were found.

Q. PCDFs?

A. I'm sorry, PCDFs were found in the PCBs manufactured by Monsanto.

Q. Okay. Stop, if you will. Do you recall what the detection limit was at that point in time?

A. As best I remember, five parts per million.

Q. All right. If there were poly chlorinated dibenzofurans in that mixture at a level of four point five parts per million, would

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it have been detected?

A. That's getting a little close. When the chemist tells me five parts per million, it's plus or minus fifty percent so there's a range.

Q. Let's use two.

A. Two?

Q. Yes.

A. Would be borderline.

Q. But the possibility is it wouldn't be detected; isn't that correct, even though it was present?

A. With the methodology available at that time, you're correct.

Q. Tell me about the other time that your product was tested for poly chlorinated dibenzofurans.

A. As I remember, about 1976 or 7, using more sophisticated methods, our chemists did find --

MR. WHITEHEAD: What year was that?

A. About '60 -- I'm sorry, '76 or 7. What did I say, '67?

MR. WHITEHEAD: Yes.

A. I meant '76 or '77, our chemists using new methodology that had been evolving did detect

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poly chlorinated dibenzofurans in some of the Aroclors.

Q. Do you recall which ones?

A. Yes. The 1254 and the 1242. But not the 1016.

Q. Do you recall at what levels they were found?

A. As I recall, it's about two parts per million, somewhere in there.

Q. Had your process of making 1242 or 1254 changed substantially since 1955?

A. No.

Q. Is it then safe to assume that had the technology been there, you would have detected those chemicals in the 1242 and 1254 during the '60s?

A. That's so speculative I just -- I don't know.

Q. Okay. Let me just take a second if you don't mind and I'll be finished.

(Discussion off the record)

MR. BONDS: I just have a couple more questions. Did Jack Garrett work for Monsanto?

A. Yes.

Q. What was his job title, if you know,

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during the period of late '50s and '60s?

A. I don't know the official title but he was looked upon in Monsanto as the corporate industrial hygienist.

Q. So he would have naturally received inquiries from customers regarding the harm that PCBs might cause to the environment or human health; is that correct? Would they have been directed to him?

A. Human health. Environment would not have gone to Jack.

Q. Okay. Who was the spokesman it would have gone to involving the environment at that time? It wouldn't have been you, would it?

A. When I was appointed in 1970, it would have been. Prior to that, it would have gone to the marketing person.

Q. Who would eventually answered that marketing person's question if he couldn't answer?

A. He would go to the researchers -- there was no official environmental entity at the time.

Q. Would the Medical Department get involved?

A. The Medical Department would get involved, and there would be a consensus opinion.

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Q. What educational background did Jack Garrett have, if you recall?

A. He is a chemist by training.

Q. Is he a doctor?

A. No.

Q. Does he have a Master's Degree?

A. Master's.

Q. He was an industrial hygienist in addition, is that what you said?

A. Yes.

Q. Was he qualified to speak for Monsanto?

A. Yes.

MR. BONDS: I don't have anything further.

RECROSS EXAMINATION

QUESTIONS BY MR. GEDDIE:

Q. Was there any reason in 1961 for Sangamo to suspect that there was an environmental hazard associated with PCBs?

A. No.

Q. What did Sangamo-Weston do when the leaking containers of waste were pointed out to them in 1974? Didn't they in fact request a meeting with Monsanto?

A. Oh, yes. They -- in fact, Monsanto sent

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representatives to the Sangamo Plant to observe the loading of material to be returned and sought their counsel and advise on how to do it, what to look for, how to brace it, to take photographs, to show that the shipment was braced properly and so on.

Q. Is it fair to say that once the problem was brought to their attention, they responded and responded immediately?

A. Yes.

Q. When the PCDFs were detected in 1242 in 1976 or thereabouts, was Monsanto still selling 1242 at that time?

A. No.

Q. It had stopped selling 1242 in 1971?

A. Correct.

Q. So at the time PCDFs were detected, Sangamo had been out of the 1242 business for approximately five years?

A. Correct.

Q. Were any PCDFs detected in Formula 1016?

A. No.

Q. Were there ever any communications, to your knowledge, between Monsanto and Sangamo regarding poly chlorinated dibenzofurans?

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A. The communications that I am personally aware of is the comments that I made to representatives regarding our attempts to look for it and not finding it.

Q. All right. When was that, Mr. Papageorge?

A. That was in the period '70 through '76. I do not know what happened after I was reassigned.

Q. Mr. Bonds pointed out that you and I had conferred over a break, Mr. Papageorge. Did I in any way suggest that you tell anything other than the complete truth?

A. No.

MR. GEDDIE: That's all I have. Thank you.

REDIRECT EXAMINATION

QUESTIONS BY MR. BONDS:

Q. When did you cease production in sales -- or sales of -- not production but sales of Aroclor 1254, Mr. Papageorge?

A. September, 1977.

MR. BONDS: Thank you. I have nothing further.

MR. GEDDIE: That's all.

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MR. MARION: I remind these directors have been identified. They are still subject to the judge's order that restricts their use. They cannot be -- they can only be shown to the attorneys in this case.

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COMES NOW THE WITNESS, WILLIAM B. PAPAGEORGE, and having read the foregoing transcript of the deposition taken on the 10th day of July, 1987, acknowledges by signature hereto that it is a true and accurate transcript of the testimony given on the date hereinabove mentioned.

_____

WILLIAM B. PAPAGEORGE

Subscribed and sworn to me before this _____ day of _____, 1987.

My Commission expires: _____

_____

Notary Public

WATER_PCB-SD0000060896

State of Missouri)
) SS.
City of St. Louis)

I, VICKIE L. HUELSMAN, a Notary Public in and for the State of Missouri, duly commissioned, qualified and authorized to administer oaths and to certify to depositions, do hereby certify that pursuant to Notice in the civil cause now pending and undetermined in the United States District Court for the District of South Carolina, Anderson Division, to be used in the trial of said cause in said court, I was attended at the Marriott Airport Hotel, Room 3114, in the County of St. Louis, State of Missouri, by the aforesaid witness; and by the aforesaid attorneys; on the 10th day of July, 1987.

The said witness, being of sound mind and being by me first carefully examined and duly cautioned and sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, thereupon testified as is shown in the foregoing transcript, said testimony being by me reported in shorthand and caused to be transcribed into typewriting, and that the foregoing pages correctly set forth the testimony of the

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aforementioned witness, together with the questions propounded by counsel and remarks and objections of counsel thereto, and is in all respects a full, true, correct and complete transcript of the questions propounded to and the answers given by said witness; that signature of the deponent was not waived by agreement of counsel.

I further certify that I am not of counsel or attorney for either of the parties to said suit, not related to nor interested in any of the parties or their attorneys.

Witness my hand and notarial seal at St. Louis, Missouri, this _____ day of _____, 1987.

My Commission expires August 8, 1990.

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Notary Public in and for the State of Missouri

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