

Page 204 1 In The Superior Court 2 Of The State Of Delaware 3 In And For New Castle County 4 -----x 5 Monsanto Company, : 6 Plaintiff, : 7 : Civil Action Number 8 v. : 88c-ja-118-1-cv 9 Aetna Casualty & Surety Company, : Non-arbitration 10 et al. , : Case 11 Defendants. : 12 -----x 13 Deposition Of James R. Savage (Volume 2) 14 Wilmington, Delaware 15 Wednesday, May 19, 1993 16 Deposition of James R. Savage, called for further 17 examination pursuant to agreement by counsel, at the law 18 offices of Smith, Katzenstein and Furlow, 1220 Market 19 Street, Fifth Floor, at 9: 50 a. m. before Kristine A. 20 O'connor, Court Reporter, when were present on behalf of the 21 respective parties: 22 -- continued --	Page 206 1 C O N T E N T S 2 Witness Examination 3 James R. Savage (Resumed) 4 by Mr. Brock 207 5 E X H I B I T S 6 Savage Deposition Number Identified 7 Exhibits 39 through 45 - Correspondence 207 8 Exhibit 46 - Anniston plant map 264 9 Exhibit 47 - 4/7/70 Memorandum 278 10 Exhibit 48 - 11/2/71 Memorandum 280 11 Exhibit 49 - 11/5/71 Memorandum 285 12 Exhibit 50 - 7/2/71 Memorandum 287 13 Exhibit 51 - 85/71 Memorandum 289 14 Exhibit 52 - 11/30/71 Memorandum 292 15 Exhibits 53 and 54 - 12/2/71 & 12/8/71 Memo 294 16 Exhibits 55 and 56 - 1/4/72 & 1/13/72 Memorandum 299 17 Exhibits 57 through 84 - Correspondence 303 18 Exhibit 85 - Standard Manufacturing Process 19 for Aroclors-department 246 20 Exhibits 86 and 87 - 7/10/72 & 8/22/73 Memorandum 372 21 Exhibit 88 - 10/24/74 Memorandum 377 22 Exhibits 89 and 90 - 5/22/75 Memorandum 23 and 5/28/75 Memorandum 380 24 Exhibit 91 - Monsanto 1. a submission 382 25 Exhibits 92 and 93 - 11/6/75 & 12/5/75 Memo 384 26 Exhibit 94 - Pcb Emergency Plan 390 27 Exhibit 95 - 2/3/76 Memorandum 390 28 Exhibits 96 and 97 - 8/1/72 Memorandum 394 29 Exhibit 98 - 8/6/70 Memorandum 399 30 Exhibit 99 - 9/1/72 Memorandum 401
Page 205 1 Appearances: James F. Burnett, Esq. 2 Potter, Anderson & Corroon 3 350 Delaware Trust Building 4 902 Market Street 5 Wilmington, Delaware 19801 6 On behalf of Plaintiff Monsanto Company. 7 Stephen F. Brock, Esq. 8 Manta and Welge 9 One Commerce Square 10 Thirty-seventh Floor 11 2005 Market Street 12 Philadelphia, Pennsylvania 19103 13 On behalf of Liberty Mutual Insurance Company.	Page 207 1 P R O C E E D I N G S 2 Whereupon, 3 James R. Savage 4 resumed the stand and, having been previously duly sworn, 5 was examined and testified further as follows: 6 Examination (continued) 7 (Savage Exhibits 39 through 45 8 identified.) 9 By Mr. Brock: 10 Q Good morning again, Mr. Savage. 11 For the record, I've had a number of documents 12 marked as exhibits. They're Exhibits 39 through 45, and 13 I'd like to start with Exhibit 39. That's dated December 14 5, 1958 and the Bates numbers -- or the Bates number is 15 Ann 1539115. 16 Let me know when you've had a chance to look 17 through that, Mr. Savage. 18 (Witness reviewed the document.) 19 A Okay. 20 Q Can you identify what this is for us? 21 A Pardon me? 22 Q Can you identify what this is for us?

Page 208 1 A What this -- 2 Q Right, what the document is? 3 A It's a letter from Cliff Stutz to Professor 4 Eliassen at Mit. 5 Q It makes a reference to J. R. Savage, pollution 6 control engineer. Do you see that? 7 A Yes. 8 Q Were you pollution control engineer at the 9 Anniston plant in December of 1958? 10 A No, I never had that title. 11 Q Do you know why there's a reference, why there's 12 a discussion of you as a pollution control engineer here? 13 A Cliff was encouraging me to take that career 14 direction and perhaps it was wishful thinking on his part. 15 Q Can you describe for me how he went about 16 encouraging you to take that career direction? 17 A Just in discussions that we had. 18 Q Do you recall the discussions and what they 19 consisted of? 20 A No, it was just very casual. 21 Q Did you ever take any courses or instruction 22 relating to the subject of pollution control around that	Page 210 1 in the plant and I think in the city as well. 2 Q When you say there were bad odors that were 3 coming out, was that an ongoing thing or was that something 4 that happened -- strike that. 5 Was that an ongoing thing? 6 A It was at least a frequent thing. I don't 7 remember whether it was continuous or not. 8 Q I'm trying to distinguish it from the situation 9 of was this a new situation or was it something that dated 10 back a ways? 11 A Well, I think it began as of the start-up of the 12 parathion department which was just before I got there. 13 Q Do you recall what your involvement was in the 14 odor reduction tests? 15 A I took samples and took them to the lab or 16 carried out various things that Cliff had defined. 17 Q Was it ever resolved what the odors consisted of? 18 A I don't remember that the materials were 19 identified as to specific chemicals. They were typical 20 sulfur compounds. 21 Q Were there changes made to the operations of the 22 Niran plant as a result of those odor reduction tests?
Page 209 1 time? 2 A No. 3 Q What was your reaction when Cliff Stutz tried to 4 encourage you to take that career direction? 5 A It didn't interest me. 6 Q Did Mr. Stutz make the same approach to others at 7 the Anniston plant that you recall? 8 A I don't know. 9 Q The document references odor reduction tests to 10 be made on the Niran wastes from the Anniston plant. Do 11 you see that? 12 A Yes. 13 Q Do you recall there being odor reduction tests 14 around that time frame? 15 A There was an odor reduction effort going on and I 16 was working with Cliff on that and I do remember that there 17 were some studies done with Dr. Eliassen, but that's about 18 all I remember about that. I don't remember sending these 19 samples, although probably I did. 20 Q Do you recall what the impetus was for the odor 21 reduction tests? 22 A There was a bad odor that came out of the sewers	Page 211 1 A We installed the chlorination tower so that the 2 waste would be chlorinated before it went -- well, before 3 it left the operating department, it would have been 4 upstream of the limestone bed. 5 Q Were there any other changes instituted as a 6 result of those tests? 7 A No. The limestone tower -- excuse me, the 8 chlorination tower eventually proved to be quite efficient 9 and nothing else was considered to be necessary. 10 Q There's a statement that this work is beyond the 11 scope of the investigation you had been doing for Monsanto 12 and the city of Anniston. That's in the next-to-last 13 paragraph in the memo. Do you see that? 14 A Yes, I see that but I don't know anything about 15 it. 16 Q Do you recall, did you work with Dr. Eliassen on 17 any other projects? 18 A No, I never met him that I know of. 19 Q There's a reference in the next paragraph to 20 mixing -- it appears to reference mixing of Niran wastes 21 with dye wastes ; do you see that? 22 A Yes, I see that.

Page 212 1 Q Do you know what the dye wastes were? 2 A They were not from the Monsanto plant. 3 Q Do you know what that refers to, does that refer 4 to something at the Anniston waste treatment plant? 5 A I don't know. 6 Q Let's go to Exhibit 40 and again, this is 7 something called an authentication. Can you identify what 8 the document is for us? 9 A It's a memo from John Mullendore to Cliff Stutz. 10 Q And you're listed as a copy recipient? 11 A Yes. 12 Q Just for the record, the Bates number is 13 Ann 1539114. This makes a reference to extending the study 14 to oxidizing agents other than chlorine. Do you see that? 15 A Yes. 16 Q Do you recall what other oxidizing agents, if 17 any, were tested for other than chlorine? 18 A I'm not aware of any other testing. 19 Q And there's a question down below at the bottom 20 of the second paragraph, " how is a test for color 21 conducted "? Do you recall how the test for color was 22 conducted?	Page 214 1 project. It was Cliff's project. He worked with Fritz 2 Rosenberg who's mentioned in this memo and also Bill 3 Garlette in designing the chlorination tower and I didn't 4 have very much to do with it. 5 Q Who was Fritz Rosenberg? 6 A Fritz Rosenberg was in organic division 7 engineering in St. Louis. He had been project manager for 8 the installation of the Niran plant and had continued to 9 provide project management for some of the improvement 10 projects. Bill Garlette worked for him. 11 Q There's a statement " since the reporting of the 12 present data by Eliassen to the City could be damaging to 13 Monsanto, it is imperative that we find a solution to the 14 odor problem. " 15 Do you know what the -- strike that. 16 Do you recall concerns coming up about whether 17 the reporting of the data could be damaging to Monsanto? 18 A No. 19 Q Do you know what that refers to, in what way the 20 reporting could be damaging to Monsanto? 21 A I could only speculate on what he means by this 22 sentence. I don't know what was going on between Monsanto
Page 213 1 A No, I don't know. 2 Q Let's go to Exhibit 41. For the record, the 3 Bates number of this is Ann 1539113. Can you identify what 4 this is for us, Mr. Savage? 5 A This is a memo from Cliff Stutz to John 6 Mullendore. 7 Q In the second paragraph towards the middle, 8 there's a statement that the odor level of the samples he 9 studied was 500. Do you know what that means? 10 A I don't know what he specifically means. A 11 typical way of testing of odor would be with progressive 12 dilutions. Perhaps this represents some threshold of 13 dilution but I don't know what the number itself signifies. 14 Q The next sentence talks about considering the 15 possibility of conducting the study by plant personnel. Do 16 you recall any discussions along those lines? 17 A No. 18 Q Who was involved in the study regarding odor 19 control of Niran liquid wastes? You said you took the 20 samples and I take it they were sent to Dr. Eliassen. Who 21 else was involved, if anybody? 22 A I was just doing some legwork on that particular	Page 215 1 and the city. 2 Q Do you recall any discussions along the lines of 3 simply whether to give the data to the city or not? 4 A No. I would not have been involved in a 5 discussion like that. I was a small fish in this pond. 6 One year out of school. 7 Q The memo ends with the statement " Perhaps I was 8 too brief in my explanation to Jim Savage when I called him 9 to arranging for the samples to be sent to Eliassen. " 10 Do you see that? 11 A Yes. 12 Q Do you recall what explanation was given to 13 you -- 14 A No. 15 Q -- concerning background of the project? 16 A No. 17 Q Do you have an understanding as to why the 18 project was, why you were assigned to the project? 19 A I was the only person available. I was -- by 20 December, I was the only person with a technical assignment 21 at the plant. The start-up crew had departed. 22 Q Let's go to Exhibit 42. For the record, it's a

Page 216 1 March 31, 1959 memo attaching a December 31, 1958 memo and 2 the Bates numbers are Ann 1539111 and 112. 3 Mr. Savage, after you've had a chance to look 4 through these, could you let me know. 5 (Witness reviewed the document.) 6 A Okay. 7 Q Can you, again, identify what these are for the 8 record. 9 A Yes, the first is a memo from John Mullendore to 10 Wayland Klemme and the second is a letter from Cliff Stutz 11 to Paul Krobs of Birmingham. 12 Q Who is R. W. Wobus? 13 A Rheiny Wobus, he was in manufacturing. I think 14 his title at that time was technical production manager. 15 He was in St. Louis. 16 Q Do you know what, if any, involvement he had in 17 the odor reduction project? 18 A No. 19 Q Who is W. W. Klemme, K-I-e-m-m-e? 20 A Wayland Klemme was chief chemist at the plant at 21 that time. 22 Q There's a reference to " fresh waste " in the	Page 218 1 A No. 2 Q Do you recognize the name Paul Krobs? 3 A I've heard the name before. I don't know if I 4 ever met him. 5 Q I take it you don't recall working with him on 6 any particular projects? 7 A No. 8 Q The second paragraph talks about an extension of 9 the scope of the investigation. Do you recall the scope of 10 the investigation concerning? 11 A No. 12 Q Just so the record will be clear -- 13 A No, I don't recall. 14 Q In the third paragraph there's a reference to 15 " textile mill wastes, " do you know what that refers to? 16 A There were textile mills in the city. 17 Q That doesn't make a reference to Monsanto wastes, 18 I take it? 19 A No. 20 Q And again, the first paragraph has a sentence, 21 " The report seems to be in order and we see no reason for 22 not releasing it to the city and the water commission. "
Page 217 1 second paragraph. What was fresh waste? 2 A It has no specific connotation. The implication 3 is simply that they're samples that have been freshly 4 taken, which would be the technically correct thing to do. 5 Q There's some handwriting down below that says 6 " memo to Savage 4/9. " Do you see that? 7 A Yes. 8 Q Do you know whose handwriting that is? 9 A Looks like Mullendore's. 10 Q Do you know what that refers to? 11 A The memo? 12 Q The note? 13 A I have no idea. 14 Q Let's go to the next page, the December 31, 1958 15 letter. In the first paragraph, there's a reference to a 16 draft of final report of the special sewer commission. Do 17 you know what the special sewer commission was? 18 A No. 19 Q Do you recall being on any sewer commissions? 20 A No. 21 Q Do you recall seeing a draft of a final report 22 concerning the Anniston -- concerning the sewers?	Page 219 1 Do you see that reference? 2 A Yes. 3 Q Does that refresh your recollection about any 4 conversations about whether to release information to 5 the -- 6 A No, I wasn't involved in those relationships. 7 Q To the city water commission? Did you have any 8 dealings with the water commission during that time? 9 A I'm not sure how the city was organized. I did 10 investigate the city waste treatment plant on one or two 11 occasions. 12 Q Do you recall what those occasions were? I'm not 13 referring to date, I'm referring to what was the impetus 14 for them? 15 A I think they related to some kind of difficulties 16 that the city had with treatment and we simply went to talk 17 to them. I remember being there but I don't remember the 18 discussion. 19 Q Were those the discussions that resulted in 20 Monsanto building its own waste treatment plant? 21 A No, that decision had been taken pretty early at 22 a much higher level than me.

Page 220 1 Q Do you recall what, if anything, came out of the 2 discussions? 3 A No. 4 Q Do you recall who else was involved? 5 A I think I went there with Cliff Stutz. 6 Q Who was J. E. Standridge who's referenced at the 7 bottom of the page? 8 A He worked for the city and he was supervisor of 9 the city's waste treatment plant. 10 Q Do you recall having dealings with him? 11 A Just that I met him when I visited the waste 12 treatment plant. 13 Q Do you know what the " J. E. " stands for? 14 A I think his first name was Jim, but I'm not sure. 15 Q Let's go to Exhibit 43. After you've had a 16 chance to look through that, Mr. Savage, could you identify 17 what that is for us. 18 (Witness reviewed the document.) 19 A It's a memo from Bob Hedworth to Bob Pohl. 20 Q And it's setting forth the Tsd objectives for 21 1959 ; is that correct? 22 A That's right.	Page 222 1 the objectives, yes. 2 Q Do you recall what, if any -- strike that. 3 Do you recall any specific objectives that you 4 thought were important at that time? 5 A No, that's too long ago. 6 Q One of the objectives or it says -- strike that. 7 In the first paragraph, it talks about things 8 that the Tsd department did in past years and one of them 9 is " practiced and publicized safety. " 10 Do you recall what, if anything, you did along 11 those lines during the time you were at the Anniston plant? 12 A In the area of safety? 13 Q Right. Practice and publicize safety. 14 A Well, our role typically would be to respond to 15 any perceived safety problem that required an engineering 16 solution. In that respect, some of the projects I worked 17 on had a goal of correcting some safety problem. I also 18 served on various accident investigation committees, 19 near-miss accident investigation committees. 20 Q Do you recall any of the safety problems that 21 needed correction at that time that you worked on projects 22 for?
Page 221 1 Q For the record, the Bates numbers of this are 2 0546027 through 0546030.01 and Mr. Savage, you're listed as 3 a copy recipient of this ; is that correct? 4 A That's correct. 5 Q And the arrow indicates that this was a copy that 6 was sent to you? 7 A Yes. 8 Q Who was R. C. Sprague? 9 A Russ Sprague was the maintenance superintendent 10 of the plant at that time. 11 Q What about C. A. Sweets? 12 A That's Clarence Sweets, was personnel 13 superintendent. 14 Q And M. M. Silver, who was that? 15 A He was another engineer in Tsd. 16 Q Were these Tsd objectives promulgated on an 17 annual basis? 18 A Yes, I think they were. 19 Q During the time that you were at the Anniston 20 plant, did you have any input into what the Tsd objectives 21 should be? 22 A Well, I would work with my boss in formulating	Page 223 1 A During the three years that I worked in the 2 parathion department doing technical work, we had several 3 incidents that could have been quite serious. A couple of 4 incidents that did cause some property damage and others 5 where, what we characterized as a near-miss, where some 6 conditions existed that could have caused a serious 7 incident but due to good fortune that incident didn't occur 8 and our practice always was to appoint -- the plant manager 9 would appoint an investigation committee and if it was in 10 the parathion department, usually I was on that committee. 11 And we would conduct our investigation as to the 12 causes and if any of our recommendations required 13 engineering improvements and those improvements were of a 14 size that could be handled as a plant project, then I would 15 be the engineer to install whatever those improvements 16 were. 17 Q You said there were some matters that caused 18 property damage. Do you recall what those were? 19 A There was at least one where there was an 20 overpressure in a reactor due to the reaction getting out 21 of control. Another in a still where there was a sudden 22 temperature runaway. I recollect that there were some

Page 224 1 others but I don't remember specifically what they were. 2 Q Okay. And the first one, the overpressure to the 3 reactor, what type of property damage resulted from that? 4 A It was confined to an immediate process system, 5 blew some piping apart. 6 Q And what action was taken in response to that 7 situation? 8 A I don't remember exactly. It was some 9 improvement to control system. 10 Q What property damage resulted from the 11 temperature runaway situation? 12 A Again, it blew apart some fairly expensive 13 piping. 14 Q Do you recall what was done in response to that 15 situation? 16 A Yes, that turned out to be a surprising design 17 booby trap that had not been suspected previously. The 18 pressure relief on those vessels was accomplished with a 19 graphite rupture disk, which is a frangible disk which is 20 designed to break at a pressure well below the designed 21 pressure of the vessel. And the discharge line from that 22 rupture disk extended into a trench below the reactors that	Page 226 1 no normal function. 2 Q What was done with the material that collected 3 there? 4 A If there was a discharge into the trench, which 5 was quite rare, then the water in the trench would have to 6 be slowly pumped to the waste treatment plant at a pace 7 that the waste treatment plant could treat and any solid 8 material left in the bottom would have to be dug out and 9 placed in disposal containers. 10 Q Do you know what happened to the disposal 11 containers? 12 A No, I don't know where they went. 13 Q Do you recall there being occasions on which the 14 solid was dug out? 15 A I know it was dug a few times but I have no idea 16 how often. 17 Q You mentioned that there were several incidents 18 that could have been quite serious. Where were you or can 19 you describe those incidents? 20 A No, I don't remember. The process was known to 21 be, to involve intermediates that were unstable and the 22 crude mass and the chlorinators and stills was thermally
Page 225 1 was put there for the specific purpose of receiving such 2 discharges. 3 And that discharge line had been submerged in the 4 water and had a very small hole in it to prevent any 5 possibility of water siphoning back into the reactor or 6 water getting into the still. Because water getting into 7 the still was known to be something that would cause a 8 runaway. It turned out that that hole designed as a safety 9 break was far too small, which I proved with an experiment, 10 and therefore we changed the configuration of that line. 11 Q What went through the discharge line? 12 A The contents of the still, which was ethyl Pct or 13 methyl Pct depending on which of the products we were 14 running at that time. I don't recall. 15 Q Where did that discharge line discharge to? 16 A To this trench that ran underneath the reactors. 17 Q Where did the trench go? 18 A It didn't go anywhere. It simply contained water 19 and other than changing the water from time to time if it 20 became stagnant and got frogs in it and so forth, it was 21 just there as a sink to quench any material that came out 22 of the reactors. It was strictly a safety back-up. It had	Page 227 1 unstable and therefore any unusual incident where 2 temperature behaved in an unusual way was always 3 investigated to determine whether there was some suspected 4 hazard and I don't remember what those were all about. 5 Q You mentioned that you were on some accident 6 investigation committees. Do you recall there being 7 investigations of any situations involving exposure of 8 workers to chemicals in the Niran department? 9 A I can remember two. I mentioned yesterday having 10 installed a device that contained an eye irritant from one 11 of the tanks, that that project came from an investigation 12 of an incident where a worker sustained sufficient eye 13 irritation that he went to the dispensary. 14 Q And I believe you said you didn't recall who that 15 worker was? 16 A No. 17 Q And what was the second situation? 18 A The second was one in which a maintenance worker 19 was working on the filter press which was used to filter 20 the finished parathion product. And he was new to the 21 experience, he had only been on the job for a day or two 22 and I don't remember what his assignment was, but at any

Page 228 1 rate, the filter still had pressure in it at the time that 2 he was working in it, so that when he released the locking 3 ring that kept it closed, it came open and he was sprayed 4 with parathion. That was considered to be a very serious 5 matter because parathion is extremely toxic. 6 Q How did you learn that parathion was extremely 7 toxic? 8 A Well, the product is an insecticide, it's known 9 to be extremely toxic. 10 Q Meant to be? 11 A Yes. 12 Q And do you recall who that maintenance worker 13 was? 14 A No. 15 Q Were any process changes instituted as a result 16 of that situation? 17 A No. We made some mechanical and procedural 18 changes but I don't remember what they were. 19 Q Do you recall there being any claims or 20 complaints by people outside of Monsanto that Monsanto's 21 operations were resulting in unsafe conditions? 22 A No.	Page 230 1 Q Under the " general " category below, referring to 2 the objectives for 1959, C is " keep abreast with new 3 developments and new techniques by reading literature. " 4 During your tenure at the Anniston plant, did you 5 keep abreast with technical or engineering literature? 6 A Well, I've always read some of the professional 7 magazines associated with chemistry and chemical 8 engineering. 9 Q Have you ever been a member of a trade 10 association? 11 A I've been a member of American Institute of 12 Chemical Engineers since 1956 and still am. 13 Q What does it take to become a member of that 14 organization? How does one become a member? 15 A Normally a degree in chemical engineering. 16 Actually when I began, I was an associate member because 17 the full membership requires a certain number of years of 18 experience. I don't remember how many. I'm a full member 19 now and have been for a long time. 20 Q You've been a member of that organization 21 continuously since that time? 22 A Yes.
Page 229 1 Q Exhibit 43, discussing the things that the Tsd 2 department had done in the past makes a reference to 3 improving public relations. Did you have any public 4 relations duties or activities during that time? 5 A I can remember doing things like speaking at a 6 career day at the high school, things like that, nothing 7 more specifically directed toward Pr than that. 8 Q Did any of your public relations efforts relate 9 to waste disposal or pollution or environmental matters? 10 A No. 11 Q There's a reference to training courses. Did you 12 take or teach training courses while at the Anniston plant? 13 A No. 14 Q Do you know what type of training courses, if 15 any, were taught to Tsd personnel at the Anniston plant 16 during your tenure there? 17 A There was some statistics training, I think. I 18 don't remember anything other than that. 19 Q Do you recall training courses regarding waste 20 disposal or environmental matters ever being instituted 21 there? 22 A No, I don't remember that there were any.	Page 231 1 Q Have you received literature from that 2 organization? 3 A They have a monthly magazine which I have 4 received all that time. 5 Q Do you recall what that's called? 6 A Chemical engineering progress. 7 Q Have you received that continuously since -- 8 A Yes. 9 Q -- you've been a member? Do you recall any 10 specific articles that you had occasion to make reference 11 to from that periodical? 12 A I don't remember specifically. 13 Q Do you recall -- does that periodical discuss 14 environmental or waste disposal matters? 15 A Yes. 16 Q Do you recall any articles that you may have read 17 in there along those lines? 18 A Not specifically. 19 Q What other professional magazines or periodicals 20 have you received during your tenure with Monsanto? 21 A There's a trade magazine called Chemical Week. I 22 have not read all of these all the time obviously. There's

Page 232 1 one called Chemical and Engineering News that's published 2 by Acs, American Chemical Society ; European Chemical News. 3 For a while I got Japan Chemical Week. There may be some 4 others. 5 Q You mentioned American Chemical Society. Have 6 you been a member of that organization? 7 A No. 8 Q Does Monsanto, during your tenure with Monsanto, 9 did Monsanto have representatives to that organization? 10 A Yes. The president of Acs was Al Heiniger 11 during, I think, his last year or two with Monsanto. 12 Q And what general time frame was that? 13 A Within the last five years. 14 Q Can you give me just a general time frame of when 15 you got these periodicals? 16 A No, I don't know. 17 Q For Chemical Week, I mean ' 50s, ' 60s, ' 70s? 18 A I can't remember. Usually the department that I 19 was a part of would subscribe to some of these magazines 20 and they'd be available on a rack and that's certainly part 21 of what went on at Anniston but which magazines they were, 22 I don't remember.	Page 234 1 material. 2 Q When you say information in the plant, are you 3 referring to things like material safety data sheets? 4 A Yes. 5 Q What other material, if any? 6 A Well, of course, in recent years there's been an 7 official government format for material safety data 8 sheets. That did not exist at the time but we had our own 9 company format for material safety data, and we would 10 normally have a sheet like that and perhaps some additional 11 written material about all the raw materials, intermediates 12 and finished goods processed in each department. 13 Q Did those Monsanto sheets have a name? 14 A I'm sure they did but I don't remember what it 15 was. 16 Q Do you recall whether or not the Anniston library 17 had materials concerning the behavior or migration of 18 chemicals in soil or water? 19 A Not that I recall. 20 Q Did the Krummrich plant have a similar library? 21 A The Krummrich plant had a better library, bigger 22 plant, more people. Working at Krummrich also, we had
Page 233 1 Q Did the Anniston plant have a technical library 2 for this kind of thing? 3 A We had a very rudimentary library at this point 4 in 1958. A little later we developed a better one. 5 Q When was the better one developed, during your 6 tenure there? 7 A Yes, Mr. Hedworth was replaced by Jim Larkin who 8 wanted to improve the professionalism of the department and 9 improving the library was one of these projects. 10 Q Do you know how far back that library dated, when 11 it started? 12 A No. 13 Q Generally during the time you were there, what 14 did it consist of? 15 A Magazines, a lot of vendor literature, which was 16 very useful to a design engineer, some handbooks. 17 Q Do you recall it containing materials about the 18 toxicity of chemicals used and generated in Monsanto's 19 operations? 20 A That would not have been in the library. We had 21 information on the toxicity of the chemicals used in the 22 plant but that would not have been general library	Page 235 1 access to the central library at the general office, which 2 was very large and comprehensive. 3 Q Did you have occasion to use the Krummrich 4 library during the time you were there? 5 A I'm sure I did. 6 Q Do you recall any specific matters? 7 A No. 8 Q When you say it had a bigger and better library, 9 can you just describe for me generally what that library 10 consisted of? 11 A I don't remember. 12 Q Back on Exhibit 43, under the " general " category, 13 is " expand the technical service department procedure 14 manual. " 15 What was that manual? 16 A I don't remember. I just remember we had one, 17 but I don't remember. 18 Q Was there such a manual for the Krummrich plant 19 during the time you worked there? 20 A Yes. 21 Q What did that consist of? 22 A It was largely a plant guideline or design

Page 236 1 guidelines for various kinds of equipment. 2 Q Do you recall having any input into the contents 3 of that? 4 A I don't recall it. 5 Q I'm talking about things or subjects that you 6 drafted or generated, materials. 7 A There might have been but I don't remember. 8 Q Do you recall consulting that procedure manual 9 for any matters relating to discharges of chemicals or 10 toxicity of chemicals? 11 A I don't recall that. 12 Q If you go on to the next page, category li is 13 " biphenyl. " 14 A That's right. 15 Q Were you involved at that time in increasing 16 biphenyl production capacity at the Anniston plant? 17 A No. 18 Q There's a reference in category number I to 19 " eliminating the benzene and the still feed. " Do you know 20 what that refers to? 21 A I do from later experience but not from anything 22 that was going on at that time.	Page 238 1 Q The references under the " Santowax " heading, were 2 you involved in any of those projects? 3 A No. 4 Q Are you familiar with there being plans for the 5 renovation of the Santowax department during that time 6 frame? 7 A I can remember Santowax renovation projects but 8 whether I knew anything about it at that time, I don't 9 remember. 10 Q Do you have an understanding as to what the 11 impetus for those projects was? 12 A No. 13 Q Do you recall any Santowax projects during that 14 time frame relating to waste disposal matters? 15 A No. 16 Q Later on at the Anniston plant, the Hb-40 17 operations were under your purview? 18 A As a production supervisor, that's right. 19 Q Were you involved in any of the projects 20 referenced on this page, on the third page of the exhibit 21 regarding Hb-40? 22 A The first one regarding a hydrogen compressor, I
Page 237 1 Q Based on your later experience, what does that 2 refer to? 3 A Benzene is the raw material for making biphenyl 4 and the next step after synthesis is to separate unreacted 5 benzene from biphenyl and if that was not done thoroughly 6 enough, it adversely affected the capacity of the 7 downstream steps. 8 Q Do you recall what the impetus was for wanting to 9 eliminate the benzene in the still feed? 10 A No. 11 Q Were you involved in any type of project like 12 that after December 1958? 13 A I was eventually concerned about capacity of the 14 biphenyl plant as a manufacturing manager in the early 15 ' 70s. 16 Q These operations were not under your purview 17 during the time at the Anniston plant that you had 18 responsibilities for the Aroclor department? 19 A No. 20 Q Were there projects here towards the elimination 21 of benzene in the still feed in the early ' 70s? 22 A No, that problem no longer existed at that time.	Page 239 1 started that up as supervisor. That was somewhat later 2 than this writing. 3 Q What was the impetus for starting that up? 4 A Prior to that project, the hydrogen supply for 5 the Hb-40 department came from the biphenyl department 6 because there was by-product hydrogen available both from 7 biphenyl and from the chlorine plant. And it was 8 determined that the hydrogen available from the chlorine 9 plant was of higher purity than that was being used from 10 the biphenyl plant and in order to utilize it, it was 11 necessary to install a compressor and we did that. 12 Q Do you recall there being any occasions on which 13 the quality of the impurity of biphenyl hydrogen 14 necessitated the product being somehow disposed of in a way 15 other than selling it to customers? 16 A No. The impetus to get rid of those impurities 17 was to reduce catalyst usage as you can see at the top 18 here. The goal was to reduce catalyst usage. The 19 consumption of catalyst is directly affected by impurities 20 in the hydrogen. 21 Q Were you involved in the second project regarding 22 the sodium treatment of Santowax?

Page 240 1 A No, I remember hearing about that but as far as I 2 know that's not something that we did. 3 Q Why was that? 4 A I don't know. 5 Q Were you involved in any of the muriatic acid 6 projects referenced here? 7 A No, this project was before I was production 8 supervisor. 9 Q Under " miscellaneous, " it talks about 10 development, demonstration and production of new Monsanto 11 plant products. Were you involved in any projects or work 12 along those lines? 13 A No, I don't know what this refers to. 14 Q Under the " Niran and methyl parathion, " B is 15 " demonstrate excess P2s5 process. " What was the excess 16 P2s5 process? 17 A We were having some difficulty controlling the 18 first step of the process, which is a reaction between P2s5 19 and either ethyl alcohol or methyl alcohol, depending on 20 which product is being made. And research had devised a 21 process in which as it says, an excess of P2s5 was present 22 in the reactor which would ensure that the reaction went to	Page 242 1 material during the process where the soda ash was opened 2 and dumped by hand? 3 A No, there was a big, a large funnel for doing 4 it. It was a reasonably orderly operation. 5 Q What does soda ash contained of? 6 A Sodium carbonate, which is a common name for 7 sodium carbonate. It's a dry powder. Sometimes called 8 washing soda. 9 Q And H refers to simplify operation of 10 incinerator. Do you know what that entailed? 11 A I don't know exactly what that project was about. 12 Q Do you know what materials were sent to the 13 incinerator at that time from the Niran department? 14 A Yes. The incinerator was in the department down 15 at one end. It really served two functions. One was to 16 dispose of still residue which was a liquid containing 17 solid sulfur. The other was to dispose of hydrogen 18 sulfide, which was a by-product of the first step of the 19 process and gaseous hydrogen sulfide entered the fire box 20 from the side through a pipe. 21 Q After the incineration of such materials, would 22 there be a residue left in the incinerator?
Page 241 1 completion. And demonstrating it simply means that a test 2 was carried out in the plant to show whether it would work 3 correctly in the plant. 4 Q What does the reference to " excess P2s5 " mean? 5 A That just refers to a change in the process where 6 more P2s5 is present than is required to act with all the 7 alcohol present. 8 Q After the reaction, would some of the P2s5 be 9 therefore left over? 10 A Yes, but it would be left in the reactor for the 11 next batch which was a solid. 12 Q Did that ever have to be gotten rid of? 13 A No, it would just always be there as what was 14 called the heel for the next batch. 15 Q G talks about a soda ash conveyor. Do you know 16 what that was, what the soda ash was? 17 A Soda ash was another one of the raw materials. 18 At the time we were buying soda ash in bags and the bags 19 were being opened and dumped by hand into a tank that was 20 used in the process. The purpose of the conveyor was to 21 simplify and automate that task. 22 Q Do you recall there being any spillage of	Page 243 1 A No. The whole idea was to get complete 2 combustion. 3 Q For example, there wouldn't be ashes or something 4 like that? 5 A I don't recall that there was any ash. 6 Q On the next page, under the " Aroclor department, " 7 it talks about " reducing Bod loading to the city sewer by 8 improving yields and by incinerating waste acetone brine. " 9 Do you see that? 10 A Yes. 11 Q Do you know what was done to reduce Bod loading 12 to the city sewer? 13 A Well, it's really hard to recall. I can see what 14 this says, improving yields and incinerating wastes acetone 15 brine. Improving yields was something we wanted to do 16 anyway and we did. I don't recall what the linkage was to 17 Bod loading. There would be an effect, but I don't 18 remember. 19 Q Do you recall there being concerns about Bod 20 loading to the city sewer at that time? 21 A Bod is the way that you measure organic loading 22 on a waste treatment plant. It stands for biological

Page 244 1 oxygen demand and there's a specific test run in the 2 laboratory to measure biological oxygen demand and higher 3 Bod means more load, which impacts billing, that is, they 4 were charging us for Bod, but also reflects what load is 5 being put on the plant and therefore what difficulty they 6 might experience. 7 Q Do you recall there being any occasions on which 8 the thought was expressed that the amount or the 9 concentration of materials being sent from Monsanto to the 10 city of Anniston sewers was simply too much for efficient 11 treatment by the sewers and therefore pollution had 12 resulted from the effluent from the city sewers? 13 A Well, the reason for building our own treatment 14 plant was to reduce the loading on the city sewer because 15 it was – it had been determined by somebody that the city 16 waste treatment plant was not big enough to reliably handle 17 the combined load of the city for the domestic waste plus 18 other wastes were going into it plus our own. 19 But I was never part of any discussion of what 20 impact that actually had on the city sewer or whether they 21 were able to treat or not. 22 Q What is waste acetone brine?	Page 246 1 engineer in the department but I don't remember when. 2 Q You said you didn't know whether the acetone 3 brine was incinerated or not. Do you mean you don't know 4 whether this step was instituted? 5 A That's right. 6 Q What was done with the waste acetone brine before 7 this time? 8 A It was drained to the sewer. 9 Q The next reference is " develop corrosion data for 10 all steps in the process. " Were you involved in that? 11 A I was involved in some of that. 12 Q Do you know what that entailed? 13 A There's a very standard procedure for doing that, 14 which involves what are called coupons or small specimens 15 of various kinds of metals. And normally those are mounted 16 on a rack and placed inside the process vessel. And after 17 exposure of a few weeks, the rack is removed and given a 18 metallurgical examination to determine which of the metals 19 are most appropriate for that step of the process. 20 Q Do you recall what the impetus for that step was 21 for developing the corrosion data? 22 A I think that that was a fairly routine step for a
Page 245 1 A I'm not sure I can place this situation in time 2 very accurately. When the plant first started up, there 3 was a problem with acetone. Acetone was used as a solvent 4 to dissolve one of the raw materials and then was recovered 5 from the reactor after the reaction step. And it was a 6 surprise that the acetone was accumulating moisture as it 7 was used and reused and reused. And to correct that, a 8 temporary system was installed whereby calcium chloride was 9 used as a drying agent to dry the acetone. 10 And it worked reasonably well but after the 11 acetone was dried, there would be a separate layer in the 12 tank of calcium chloride solution that had some acetone 13 dissolved in it. I don't remember whether we incinerated 14 that brine or not. The problem was later solved in another 15 way. 16 Q How was it later solved? 17 A We installed a distillation column to dry the 18 acetone and that worked very well. Dry acetone from the 19 top of the column and the waste from the bottom of the 20 column was pure water. 21 Q Do you know when that was installed? 22 A No. It was during the time that I was an	Page 247 1 new department, to make sure that we had the right 2 materials in all spots. 3 Q Was there a concern that corrosion of materials 4 had led to -- or equipment had led to discharges to the 5 environment? 6 A It was perceived as a maintenance problem. I 7 don't recall that corrosion specifically led to discharges 8 in the environment. 9 Q The next step is " establish heat and material 10 balance for entire process. " Were you involved in the 11 establishing of a material balance for the entire process? 12 A Yes. 13 Q Can you describe for me what that entailed. 14 A That's a standard chemical engineering exercise 15 in which one measures all the material inputs and outputs 16 to a process, calculates what the theoretical conversion 17 should be and as a result one is able to find whether 18 there's opportunities for yield improvement. 19 Q Do you recall what the impetus was for 20 establishing that as an objective with regard to the Niran 21 operations at that time? 22 A That's quite a normal thing to do for any

Page 248 1 process. We knew that overall yield was far from theory 2 and so we were confident that there were opportunities to 3 save money and the purpose of running material balance is 4 to find those opportunities so that something can be done. 5 Q Do you recall why it was that overall yield was 6 far from theory, was that ever determined? 7 A The process had been developed and researched to 8 the best of their ability. It was the best they could do 9 at the time. 10 Q Did that have anything to do with materials being 11 discharged from the process rather than going into the 12 final product? 13 A Well, again, those are just statements of the 14 same phenomenon. If the raw material isn't winding up in 15 the product, then it's going somewhere else. That's the 16 principle of the material balance. 17 Q Okay. Was it ever determined where -- describing 18 that -- strike that. 19 Was it ever determined or investigated as to 20 whether more of the material than Monsanto would have liked 21 was being discharged somehow to the environment, either 22 through the air or through the soil?	Page 250 1 unstable and would tend to decompose for a time and 2 therefore we did a number of relatively small things to 3 speed up the cycle time, which shedded large leverage on 4 yield. 5 Q Any others that you recall? 6 A No. 7 Mr. Brock: This is a good time for a short 8 break. 9 (Recess.) 10 By Mr. Brock: 11 Q Let's go to the Aroclors. I thought you told me 12 yesterday you were involved in the starting up of a 13 continuous chlorination process for the Aroclors at the 14 Anniston plant ; is that correct? 15 A Yes. This memo refers to the original 16 installation of a continuous chlorination. What I did 17 later on as a production supervisor was extend the use of 18 that continuous process to another product, another 19 Aroclor. 20 Q It says " estimate and justify. " Do you recall 21 what the justification was for that? 22 A Increased capacity.
Page 249 1 A The idea was -- of course, the purpose of this 2 work was to find whether there were practical opportunities 3 to reduce the amount of loss and there were. 4 Q Do you recall what those were? 5 A That was what the majority of my job was at the 6 time, was to figure out what those were and to institute 7 projects to correct them. And there were a lot of them. 8 Q Do you recall any of the specific ones that 9 involved reduction of discharges to soil, air or water? 10 A There weren't any discharges to air that 11 represented an economic, an amount that would be of 12 economic concern. The losses that were of economic concern 13 were either recoverable materials that were in the liquid 14 waste going to the incinerator or were present in the 15 aqueous wastes going to the treatment plant. 16 Q Do you recall any specific process changes that 17 were instituted to reduce either of those? 18 A There were a number of them that in the early 19 stage of the process is where most of the yield loss 20 occurred. We determined through statistical methods that 21 it was largely a function of the processing time, which was 22 plausible because we knew that the materials were thermally	Page 251 1 Q Under " technical assistance, " it says " reduced 2 lime addition in the step to reduce furnace coil burnouts 3 and pump failure. " Do you see that? 4 A Yes. 5 Q What were furnace coil burnouts? 6 A Let me point out I was not involved at that time 7 but based on my later experience as production supervisor, 8 each of the stills had a furnace. The crude product in the 9 still pot was pumped out of the still pot and through the 10 coil of the furnace and then back into the furnace -- or 11 back into the still pot from the furnace. The furnace 12 consisted of a cylindrical vessel with a brick lining and a 13 coil inside. 14 Stills ran at a very high temperature and those 15 coils would burn out from time to time and likewise the 16 pumps would fail. The pumps were submerged pumps in the 17 still pot. As to the amount of lime added was reduced, I 18 don't know. 19 Q In the event of a coil burnout, what would happen 20 to the material in the furnace? Was something else done 21 with it? 22 A No, because these stills operated under vacuum so

Page 252 1 if the coil failed, the air would be sucked into the system 2 rather than product going out. So it would be impossible 3 to continually run the still and so it would be shut down. 4 Q And after that happened was that product disposed 5 of in some way? 6 A No, because the furnace was actually mounted on a 7 slightly higher level than the still pot, so when it was 8 turned off, all the material that was in the furnace coil 9 just drained back into the still pot. After repairs were 10 made, it was simply started back up again. 11 Q Do you recall there being a concern about pump 12 failures? 13 A Yes, that was a maintenance problem. 14 Q Do you recall there being a concern that pumps 15 were failing too often in the Aroclor operations? 16 A These particular pumps were a very difficult 17 service since they were submerged in the still and operated 18 at a very high temperature. So there would be failures of 19 what were called foot bearings which would require shutting 20 down and removing the pump and repairing it. 21 Q And when there were failures of that type, would 22 materials, would that result in the discharge of materials?	Page 254 1 concerning historical waste disposal practices? 2 A No. 3 Q Do you know who it was that handled putting that 4 material in skips and removing it by truck to be dumped 5 during the time that you were production supervisor? 6 A Well, the responsibility for draining the still 7 residue from the stills into the skips was that of the 8 operators and laborers who were in my department. Once 9 that was done, then it was the responsibility of the 10 shipping department to take it away. 11 Q Do you recall anybody in the shipping department 12 whose responsibility that was? 13 A I remember some of the workers. The only name I 14 remember is Homer Broadwell, who was one of the drivers, a 15 kind of colorful character, that's why I remembered him. 16 Q Do you know whether Mr. Broadwell is still alive? 17 A No. He would be about 70 now, I suppose. 18 Q When you say he was a " colorful character, " in 19 what sense? 20 A An enjoyable person to talk to. 21 Q Do you know whether he was still employed by 22 Monsanto in the ' 60s or ' 70s?
Page 253 1 A No, because the pump was submerged in the vessel. 2 Q D is " follow project to completion for disposal 3 of still residue and to skips to be removed by truck and 4 dumped. " Do you see that? 5 A Yes. 6 Q Do you recall what that project was? 7 A Well, at the time that I took over the 8 department, I think that most of that still residue was 9 being handled in a fashion described here, putting into a 10 skip, which is a container a little bit like a dumpster 11 that would be attached to the back of a truck. 12 Q Do you know whether anything was different -- 13 anything different was done with the still residues before 14 December of 1958? 15 A Well, this sentence implies it but I don't know 16 what it was. 17 Q Have you ever been involved in any investigation 18 into the historical waste disposal practices with regard to 19 the Aroclor operations at the Anniston plant? 20 A No. 21 Q When you came on board as production supervisor 22 in that department, were you provided with information	Page 255 1 A Well, in the ' 60s, yes. While I was still at the 2 Anniston plant but. 3 Q But you don't know after that time? 4 A When he might have left to retire, I don't know. 5 Q The next entry for E references something called 6 Attasorb Lvm. What is that? 7 A That's a form of diatomaceous earth, clay. 8 Q What was that used for? I see that it says 9 " improving Aroclor quality, " how did that work? 10 A The last step of the Aroclor process was what was 11 called clay treatment and filtration and that involved 12 putting clay into a tank where the distilled Aroclor 13 agitated for a certain period of time and then pumped that 14 through a filter and the purpose of that was to remove last 15 traces of what were called ionizable impurities. 16 The premier application still was an electrical 17 effluence and the electrical properties of the fluid were 18 profoundly affected by amounts of impurities too small to 19 measure, chemically measure. And the test that was done 20 was an electrical test called resistivity and the purpose 21 of the clay treatment was to increase the resistivity, 22 hopefully much better than specification, so as to be sure

Page 256 1 the product was still good when it arrived to the customer. 2 Q And what was done -- I take it the clay would 3 absorb some of the ionizable impurities? 4 A Ideally, all of them. 5 Q And what was done with the -- would the clay 6 eventually become saturated with those? 7 A The clay was only used one time, each amount of 8 clay went into a batch, was filtered out and then was 9 discarded. 10 Q Do you know how it was discarded? 11 A In the same fashion as the still residue. 12 Q Would the still residues and the clay and other 13 materials be gathered and all put in one type of container 14 and taken away collectively? 15 A I don't remember. I don't think so. 16 Q For example, would they be put into separate 17 containers? 18 A The operation was in a little bit different part 19 of the department, so I can't visualize that it would be 20 the same container but I don't remember specifically. 21 Q When you say ionizable impurities, what were 22 those?	Page 258 1 microscope, you can see that that's what it is, so it's 2 silica, things like that. 3 Q I, a reference number, letter I is " revamp 4 Aroclor still room. " And number 2 under that, " Improve 5 material handling bin by centralization of drumming station 6 and providing better accessibility for removing drums. " Do 7 you see those references? 8 A Yes. 9 Q Was the Aroclor still room revamped in that 10 fashion? 11 A I don't remember. I don't remember a separate 12 control room for the stills. Could be, but I don't 13 remember. 14 Q Do you recall there being concerns about the 15 material handling with respect to the drumming involved in 16 the process? 17 A I don't know whether this project took place or 18 not. At the time that I took over the department, we had 19 reasonable material handling with roller conveyors and so 20 forth. 21 Q Do you recall concerns being expressed with 22 respect to the possibility or the frequency of spills
Page 257 1 A This would be sodium chloride, perhaps Hcl. 2 There is a large class of compounds that could cause a 3 lower resistivity and since the amounts involved were too 4 small to be chemically measured, one could never be sure 5 what it was that was being taken out. The quantities were 6 extremely small. 7 The difficulty was that simply for use in 8 capacitors, it was necessary to get the resistivity of the 9 fluid extremely high and while we knew that very tiny 10 amounts of materials like chlorides could cause a drop in 11 resistivity, we were never really sure what it was that was 12 being taken out. 13 Q Did you have the understanding as to whether or 14 not the clay itself had any sort of harmful or toxic 15 effects? 16 A I'd be reasonably confident it didn't. 17 Q Do you know what it consisted of chemically? 18 A The term " diatomaceous earth " refers to a small 19 form of life that's called a diatom, which is a little 20 bitty microbe that grows in the ocean and diatomaceous 21 earth is actually the kind of fosso-exoskeletons of those 22 little critters. If you look at that earth under a	Page 259 1 during the drumming? 2 A No. 3 Q And you also subsequently had responsibilities 4 for the chlorine operations at the Anniston plant? 5 A Yes. 6 Q B makes a reference to " liaison with division 7 engineering. " Did you have any responsibility along those 8 lines during your tenure at Anniston? 9 A Liaise with division engineering, yes, in terms 10 of the Niran department. But in terms of the chlorine 11 department, the project referred to here, to installing 12 additional mercury amalgam cells had already been completed 13 at the time I took over the department. 14 Q And C refers to " continued study of improving 15 cell linings. " What does that refer to? 16 A The cells, as they were originally constructed, 17 they were built in Italy, the linings were stone, slabs of, 18 I think, granite and that turned out to be not as durable 19 as had been hoped for, so there were attempts to put 20 various coatings on the stones to increase their life. 21 Q What was the chlorine liquification system 22 referenced in letter D?

Page 260 1 A The chlorine, as produced in the cells, is a gas 2 and most of the time that gas -- at the Anniston plant that 3 gas was used directly in the Aroclor department without 4 liquification. There was a liquification system present 5 with the idea that if the requirements of the Aroclor 6 department fell below the production rate in the chlorine 7 department, it would be possible to liquify part of the 8 output and thereby store it so that it could be used later 9 so that's what that system is -- was. 10 Q J states " determine capacity of waste neutral 11 system and design improved system if required. " What does 12 a reference to a " waste neutral system " mean? 13 A That was part of the brine area. There was a 14 piece of equipment called the waste neutral tower. I don't 15 remember how that worked. 16 Q What does the phrase " waste neutral, " what does 17 that mean? 18 A It's a rather awkward set of words actually but 19 the intention was that the waste leaving the bottom of that 20 tower would be neutral in ph, meaning it's neither acid nor 21 alkali. 22 Q You said that system consisted of a tower?	Page 262 1 go to Exhibit 44. Can you identify for us what this is? 2 A It's a memo from Cliff Stutz to Fritz Rosenberg 3 reporting on a visit he had made to Anniston. 4 Q The first paragraph of this references a meeting 5 with Mayor Morris regarding charges being made by the city 6 for treating the Niran wastes. 7 Do you recall such a meeting? 8 A No. 9 Q Did you know Major Morris? 10 A Mayor Morris. 11 Q I'm sorry, Mayor Morris. 12 A I don't think I ever met him. 13 Q Number 4 states " The need for a long range 14 program on Anniston was pointed out to the mayor. " 15 Do you see that? 16 A Yes. 17 Q Do you recall being involved in the formulation 18 of any long-range program for waste treatment with regard 19 to the Niran plant? 20 A No. 21 Q Do you know who was -- strike that. 22 Do you recall such a plan being developed?
Page 261 1 A Yes. 2 Q Did it consist of anything else? 3 A There were some pumps and vacuum jets involved, 4 but I don't remember how that was all connected together. 5 Q What was sent to that system? 6 A The spent brine leaving the cells was saturated 7 with chlorine and that chlorine had to be removed before 8 the brine was further processed to resaturate it. And the 9 chlorine was removed from the spent brine by placing the 10 brine under a vacuum while it passed down through a packed 11 tower. So coming from the top of that packed tower was a 12 stream of wet chlorine gas and the waste neutral system was 13 provided to process that wet chlorine gas. Most of it 14 wound up back in the product chlorine. I don't remember 15 why, but for some reason there was some of it that had to 16 be scrubbed. 17 Q And the material that did not go back into the 18 process, where did that go? 19 A That was neutralized in this tower called the 20 waste neutral tower with a small amount of caustic, and so 21 it went to the sewer as sodium hypochlorite. 22 Q Mercifully, I'm finished with that one. Can we	Page 263 1 A I don't know if there was such a plan. 2 Q Down below, after the numbered paragraphs, 3 there's a sentence which reads " At a meeting with Jim 4 Mullendore, Jim Savage and myself, the following program 5 was set up for the waste treatment pilot lagoon. " Do you 6 see that? 7 A Yes. 8 Q Do you recall being involved in discussions 9 concerning a waste treatment pilot lagoon? 10 A I don't recall the discussions. I remember the 11 pilot lagoon. 12 Q What was the pilot lagoon? 13 A That was one of the ideas that was tested as a 14 way of treating waste. Lagoon treatment is probably the 15 simplest way to treat wastes. The word describes what it 16 is and one relies on sufficient oxygen transfer from the 17 atmosphere down into the surface of the lagoon to 18 accomplish a biochemical oxidation. 19 Q Do you recall what the impetus was for the 20 initiation of that waste treatment pilot lagoon? 21 A Well, as I recall, we had decided that we would 22 provide some treatment of the waste inside the plant and

Page 264 1 this was a first test of one method. 2 (Savage Exhibit 46 identified.) 3 By Mr. Brock: 4 Q I'm having marked as Exhibit 46 a one-page 5 document with the Bates number Ann 1211651 and it's a map 6 of the Anniston plant. 7 Mr. Savage, just by reference to what we've had 8 marked as Exhibit 46, I was wondering whether you could 9 indicate where that pilot lagoon -- the waste treatment 10 pilot lagoon was set up? 11 A At the time that we had a lagoon, the plant 12 layout was a little different from this. This map seems to 13 be from a time after I left the plant. The way I remember 14 it, it would have been just to the northeast of the 15 rectangle with a line through the middle labeled " hold 16 tanks. " So on the map it would be down and to the right a 17 little ways. 18 Q Can you indicate, just draw a circle or a square 19 or a box or something where that would have been and with 20 an arrow, put waste treatment plant pilot lagoon? 21 A I started to write -- 22 Q That's fine.	Page 266 1 that pilot plant and took samples and so forth to generate 2 data for Cliff Stutz so that he could design a full-sized 3 activated sludge unit. 4 Q Do you recall whether any lagoons were used for 5 treatment of Niran wastes? 6 A Could be. It could be we had a lagoon for an 7 interim period or something but I don't remember that. 8 Q You don't recall any being used on a more 9 permanent basis? 10 A I remember the test lagoon and whether that 11 was -- I don't know whether that was used on an extended 12 basis or not. 13 Q Do you recall whether lagoons were used for any 14 wastes coming from the Aroclor department there? 15 A As far as I know that was never done. 16 Q What about the chlorine department? 17 A There was no Bod from the chlorine department to 18 treat. 19 Q Are you familiar with lagoons being used for 20 wastes coming from any of the other departments at the 21 Anniston plant? 22 A No.
Page 265 1 A -- " test lagoon. " 2 Q Test lagoon. And just for clarity of the record, 3 if you'd like, you can put late 1950s. 4 A Okay. 5 Q Was a permanent lagoon set up? 6 A No. It was determined that a lagoon system would 7 not be a satisfactory way of doing a treatment. 8 Q Why was it -- what was the reason for that 9 determination? 10 A I think the original idea was that it might be a 11 low cost way of achieving a significant reduction in Bod. 12 The test data didn't support that so we had to do something 13 more elaborate. 14 Q When you say " the test data didn't support that, " 15 were the test data that it was expensive or that it didn't 16 reduce Bod? 17 A It didn't sufficiently reduce Bod. 18 Q Do you recall what steps were eventually taken? 19 A Yes. Right about this time, perhaps shortly 20 after the period of these memos we began a study of the 21 activated sludge process and a pilot-activated sludge unit 22 was erected right next to the hold tanks and I operated	Page 267 1 Q Down on the bottom of the first page of Exhibit 2 44, there's a reference to separating the strong from the 3 weak wastes. What do the references to " strong and weak 4 wastes " refer to? 5 A I don't know what he was specifically referring 6 to. 7 Q And there's some handwriting to the left of that 8 that says " Savage, do you " and there's another word that I 9 can't read and is it " enough "? 10 A That's John Mullendore's writing and I think it 11 says " Savage, do you need another Mro " and Mro was a 12 maintenance -- or a minor repair order and it was simply a 13 way of authorizing, spending some money for whatever I 14 needed to get done. 15 Q And on the next page there's some handwriting 16 that also says " Jim Savage. " Can you read that 17 handwriting? 18 A I think it says " Jim Savage, what samples require 19 special sampling? " 20 Q Do you know what that refers to? 21 A No. 22 Q Number two, it talks about routine sampling of

Page 268 1 the lagoon wastes will be placed on a weekly basis. Do you 2 see that? 3 A Yes. 4 Q Would " special sampling " be referring to 5 something other than or in addition to that? 6 A That's what the words mean, but I don't remember 7 which of these samples might have been considered special. 8 Q What was the upper pond? 9 A Well, as mentioned earlier in this same memo, 10 there was a partition placed through the lagoon, so this 11 must refer to the two parts of the lagoon as a pond. But I 12 don't know why there would have been different samples from 13 the two parts. 14 Q So the upper pond and lower pond just refer to 15 different parts of the test lagoon? 16 A I think so. 17 Q There are references to Pnp under the upper pond 18 and lower pond and also on the previous page talking about 19 reduction of Pnp. What was Pnp? 20 A Paranitrophenol. 21 Q Was that used in the Niran operations at the 22 Anniston plant?	Page 270 1 Q If you turn to page 3 up at the top, there's a 2 reference to a meeting with the city sewage treatment plant 3 superintendent. Do you know who that was? 4 A I presume that refers to Mr. Standridge. 5 Q Do you recall meeting with Mr. Standridge in or 6 about that time? 7 A No. 8 Q Do you know who would have been at that meeting? 9 A No. 10 Q Number two talks -- it says " the plant was 11 alerted regarding a change in the process in the 12 manufacture of Niran. " 13 Do you know what that change was? 14 A No, I don't remember. 15 Q Number three talks about the disposal of lime 16 sludge in the south hold tank. Do you know what the south 17 hold tank was? 18 A I presume that refers to some part of a city 19 treatment plant. I don't recall anything -- well, I don't 20 know. It may have been with the city treatment plant or 21 they might be referring to something at the Anniston plant 22 but I don't recall something called a hold tank.
Page 269 1 A Yes, it was one of the raw materials. 2 Q Was that discharged in the aqueous wastes from 3 the Niran department? 4 A Yes. 5 Q And there are references under the lower pond to 6 nitrates and phosphates. Were those also raw materials in 7 the Niran operations? 8 A No. None of the raw materials were nitrates or 9 phosphates. 10 Q Were those materials that were discharged? 11 A I don't know. Those are things that they would 12 reasonably be analyzed for, but whether they were present, 13 I don't know. 14 Q Why would they be reasonably analyzed for with 15 respect to the Niran operations? 16 A Well, Cliff Stutz had a background in sanitary 17 engineering and he would be interested in what nutrients 18 were available for the organisms that were there and in 19 order to facilitate biological oxidation and nitrates and 20 phosphates would be not only potential pollutants but also 21 nutrients for the organisms so it would be important to 22 know what quantities were present.	Page 271 1 Q If you look back at Exhibit 46, the area where 2 you marked the test pilot plant is in an area where you 3 mentioned that there were dividing lines between the hold 4 tanks. 5 A Perhaps that's what it refers to. 6 Q Do you recall there being lime sludge from the 7 Niran operations? 8 A Not from the Niran operation but the 9 neutralization pit used limestone and there would be a 10 sludge left from that. I don't recall if that sludge would 11 have necessarily been in the hold tank. 12 Q Do you know what lime sludge, if any, would have 13 been in the hold tanks? 14 A No. 15 Q It says " the superintendent agreed to handle this 16 through their sewers but would bypass the plant. " Does 17 that refresh your recollection at all as to what the lime 18 sludge was? 19 A No, I don't remember this event at all. 20 Q Do you know what that refers to, the reference to 21 the superintendent agreeing to handle it through their 22 sewers but bypassing the plant?

Page 272 1 A Well, I could interpret that sentence but I don't 2 know anything about it. 3 Q What would your interpretation of the sentence 4 be? 5 A That when that material arrived at the plant 6 through the sewers, they would divert it around their 7 treatment plant. 8 Q And why would that have been done? 9 A I don't know. 10 Q There's a reference down below to " the discharges 11 of sludge will be done after 10: 00 p. m. so that any odor 12 associated with the sludge will not be noticed. " 13 Do you recall that being done? 14 A No. There's no reason why I would know what was 15 being done at the city treatment plant. 16 Q Do you interpret that to be discharge from the 17 city treatment plant? 18 A Well, I can't add anything to the words that are 19 in the paragraph. 20 Q Let's go to Exhibit 45. Again, can you identify 21 what that is for us? 22 A This is a memo from Bob Hedworth, which was the	Page 274 1 were for the next month or two or perhaps the next quarter. 2 Q Do you recall making any such presentations 3 concerning environmental or waste disposal matters? 4 A I'm sure I did. I can't remember the subject 5 matter of any of them in particular. 6 Q Under Aroclors, " the first program is revise 7 design data for disposal of still residue. " Do you see 8 that? 9 A Yes. 10 Q Do you recall that going on in or about 1959? 11 A No, I was involved in Aroclor at the time. 12 Q The phrase " design " -- " revise design data, " does 13 that refer to or -- strike that. 14 What does that refer to? 15 Mr. Burnett: Object to the form of the 16 question. Lack of foundation. 17 By Mr. Brock: 18 Q Do you know what that refers to? 19 A No. 20 Q During your employment with Monsanto have you 21 used the term " design data "? 22 A Sure.
Page 273 1 minutes of an engineering planning meeting held on February 2 9, 1959. 3 Q And the arrow in the top right-hand corner 4 indicates that this was a copy that was sent to you ; is 5 that correct? 6 A That's right. 7 Q Who is J. H. Starr, S-t-a-r-r? 8 A Hugh Starr was at that time the supervisor of the 9 Aroclor department. 10 Q Do you recall attending engineering planning 11 meetings during that time? 12 A Yes. Those were -- something doesn't quite fit 13 here for me because the people listed here are Pohl, 14 Edelbut, Sprague and Hedworth and what I recall was that 15 the engineering planning meetings were held when there was 16 a visitor from St. Louis who was responsible for the 17 technical program at the Anniston plant and I don't see 18 such a person listed among those present so I don't quite 19 understand this. 20 Q When you attended engineering planning meetings, 21 what did those meetings generally consist of? 22 A A series of presentations about what our plans	Page 275 1 Q When you've used the term, what have you used it 2 to refer to? 3 A Design data usually refers to the information 4 needed to prepare a design ; design data becomes part of the 5 design for a project. 6 Q Do you recall there being contemplations of 7 revisions in the way that still residues were to be 8 disposed of around that time? 9 A No. 10 Q When you took -- or when the Aroclor department 11 came under your purview as production supervisor, were 12 there revisions going on to the way that Aroclor still 13 residues were disposed of? 14 A I just remember that we had the skip system in 15 place. I don't remember that there were revisions made 16 during my time. 17 Q Did you have discussions about revisions that had 18 been made before you took on that department? 19 A I don't remember. 20 Q And under the Niran department your name is 21 referenced to the right? 22 A Yes.

Page 276 1 Q Does that indicate to you that the matters 2 referenced for the Niran department were assigned to you? 3 A Yes. 4 Q Do you recall doing a survey of the Niran 5 department? 6 A Yes, that was routine. 7 Q Do you recall what that consisted of? 8 A I would think the material balance that we 9 referred to earlier. 10 Q How would you go about surveying the department 11 just as a matter of practice? 12 A To determine for potential savings? 13 Q Right. 14 A The first step always was the material balance ; 15 after that, an analysis of the cost reports which would lay 16 out all the other elements of cost other than -- in 17 addition to raw materials and from that try to determine 18 what costs could be reduced and whether it could be done in 19 a cost-effective way. 20 Q Do you recall looking into the cost-effectiveness 21 of the waste disposal methods used in the Niran department? 22 A No. I did some technical work in connection with	Page 278 1 Mr. Brock: Off the record. 2 (Discussion off the record.) 3 (Savage Exhibit 47 identified.) 4 By Mr. Brock: 5 Q I've marked as Exhibit 47 a two-page document 6 dated April 7, 1970 with Bates numbers 0291924 and 25. 7 Mr. Savage, is this a copy of a memo that you 8 received in the ordinary course of your employment with 9 Monsanto in or about April of 1970? 10 A Yes, it appears to be. 11 Q There's a category near the bottom of the first 12 page regarding known losses to sewer in March. Do you see 13 that? 14 A Yes. 15 Q Do you recall how that terminology was to come 16 about? 17 A I don't know why that expression was used. In 18 this context it really refers to specific incidents that 19 occurred during the month. 20 Q Why do you say that? 21 A Well, it just says " Department 243, 55 pounds 22 estimate. Department 251, 600 pounds estimated. " There
Page 277 1 the eventual waste disposal plant that was installed, but I 2 don't recall any opportunities for cost reduction. The 3 work was entirely on the question of making it as effective 4 as possible. 5 Q Do you recall what, if anything, you did with 6 respect to Pnp recovery and I'm referring to item 3? 7 A As I recall it, Pnp recovery was an idea that was 8 not implemented. 9 Q Why was that not implemented? 10 A I think we found ways to improve the once-through 11 yield that reduced Pnp losses to the point that a recovery 12 project would not be economical. 13 Q The Pnp losses that you referred to, what did 14 those consist of? Were they aqueous, were they solids? 15 A Entirely aqueous. 16 Q Did they go to the sewers? 17 A Yes. 18 Q Do you recall what, if anything, did you do with 19 respect to following excess P2s5 demonstration? 20 A Well, we carried out the demonstration. I don't 21 remember whether that process change was permanently 22 adopted or not.	Page 279 1 must have been a basis for such an estimate. 2 Q Do you know how it was determined whether 3 something would be put under the known loss heading or 4 category? 5 A No. 6 Q The next page makes a reference to " the routine 7 loss from Department 246 " and that's in the second 8 paragraph? 9 A Yes. 10 Q Do you see that? 11 A Yes. 12 Q Do you know what the reference to " routine loss 13 from Department 246 " refers to? 14 A From the context, it refers to the continuing 15 loss from the department that was being experienced. 16 Q And in your understanding that was from the 17 normal operations of the department? 18 A Yes. 19 Q That sentence talks about a reduction of the 20 routine loss by installing a drain line from the vapor 21 header immediately upstream from the drowning jet. 22 Can you just describe for me -- or explain to me

Page 280 1 what that's referring to? 2 A I'm not sure I can explain it all because I don't 3 remember well enough. The drowning jet would have been a 4 scrubbing jet that -- a water scrubber, handling air from 5 the blow tanks. As to the rest of the statement, I can't 6 add anything to what the sentence says, that it was " a 7 drain line installed from the vapor header. " 8 Q Where it says " any liquid in this header is 9 caught in a drum and was taken to the dump. " Do you know 10 what that liquid would have consisted of? 11 A It would have consisted of biphenyl and lightly 12 chlorinated biphenyl. 13 Q Do you know when the procedure was set up of 14 taking that to the dump? 15 A No. 16 Q Were you familiar with that during your -- strike 17 that. 18 Do you know whether that was in place during the 19 time you were at the Krummrich plant? 20 A This report says it had been installed presumably 21 in the month it's being reported on. 22 (Savage Exhibit 48 identified.)	Page 282 1 A I think I mentioned yesterday the plant is very 2 old, and the sewer system has been repaired, and additions 3 have been made to it several times during the life of the 4 plant, and therefore it's fairly complicated. Some parts 5 of it are quite old and that made it difficult to carry out 6 our sampling program in such a way as we could determine 7 the origins of the Pcb's in the waste. 8 This paragraph refers to a facet of that, but I 9 don't remember that particular facet. 10 Q Do you recall there being an investigation into 11 the reason for the sewer problems? 12 A No, I wasn't involved in that. 13 Q Down below that it says " a major project is being 14 prepared to replace the sewer system in the area. " Do you 15 see that? 16 A Yes. 17 Q Are you familiar with a major project being 18 undertaken to replace the sewer system in the area? 19 A I remember there was a sewer project, but I don't 20 remember how big it was or exactly what the purpose was. 21 Q Do you recall the sewers from the Aroclor 22 operations being replaced?
Page 281 1 Mr. Brock: I have marked as Exhibit 48 a 2 memorandum dated November 2, 1971. 3 By Mr. Brock: 4 Q Mr. Savage, is this a memorandum that was sent to 5 you in the ordinary course of your employment with 6 Monsanto? 7 A Yes. 8 Q If you look in the second paragraph under the 9 letter A, it states " it was discovered that the underground 10 sewer system and sewer boxes in area are leaking very 11 badly. " Do you see that? 12 A Yes. 13 Q And up above that in the very first paragraph in 14 the text under the heading, it talks about " Aroclor sewer 15 loss. " Do you see that? 16 A Yes. 17 Q Do you recall it being discovered that the 18 underground sewer system and sewer boxes from the Aroclor 19 operations were leaking very badly? 20 A I remember there were sewer problems but I don't 21 remember any more than that. 22 Q What do you recall about the sewer problems?	Page 283 1 A No. 2 Q Who would have been involved in that replacement 3 of the sewers? 4 A Well, the maintenance department certainly, and 5 probably the utilities department. 6 Q Do you recall discussing replacement of the 7 sewers with anybody from the maintenance department or the 8 utilities department? 9 A No. 10 Q Was there somebody within the maintenance 11 department or utilities department with specific 12 responsibilities regarding the sewers? 13 A Well, that would be normal in terms of the way a 14 plant is organized but I don't know who it would be. 15 Q If I could turn you to page 3 of the exhibit 16 under " program status. " It states " Pcb task force formed 17 with members of production, maintenance, Tsd and the 18 environmental group. " Do you see that? 19 A Yes. 20 Q Do you recall there being a Pcb task force 21 formed? 22 A Not specifically.

Page 284 1 Q Do you recall being a member of any Pcb task 2 force? 3 A That's a little bit -- I'm stuck a little bit on 4 semantics. Of course I was working on Pcb matters as part 5 of the business group team, but I don't remember whether 6 any group that I was involved with was called a task force. 7 Q To me that just indicates that a separate entity, 8 some sort of group was set up at this time, is that how you 9 would -- 10 A Yes, but based at the plant. And I was not at 11 the plant at that time. 12 Q Do you recall dealing with any entity that was 13 referred to in words or substance as a Pcb task force at 14 the Krummrich plant? 15 A No, normally I had one contact at each plant that 16 I would talk to about this sort of thing. At this 17 particular time, it was Ed Stewart. 18 Q If you turn to the last page of the exhibit. 19 There's a reference, it says " Fr2 will be sent to the 20 Wgk plant for incineration. " Do you see that? 21 Oh, you must have a different last page. 22 (Discussion off the record.)	Page 286 1 you see that reference? 2 A That's right. 3 Q And I neglected to ask you this on the previous 4 document. There's a reference to cross flow between the 5 sewer system and the underground water being possible. 6 What does that refer to? 7 A Well, it's a logical consequence of the leaks 8 that are described there. As I mentioned before, I don't 9 specifically remember leakage of these sewers per se as 10 being a specific problem. 11 Q I would interpret the reference to cross flow 12 meaning -- to refer to mixing of the water or the materials 13 in the sewer with the materials in the underground water, 14 would that be a fair interpretation? 15 A I would interpret it the same way. But I just 16 don't remember the incident. 17 Q Does that refresh your recollection at all as 18 to -- strike that. 19 Do you recall there being an investigation as to 20 whether or not there was such a cross flow or mixture? 21 A No. 22 Q Do you know whether it was determined whether or
Page 285 1 By Mr. Brock: 2 Q Or do you recall something called Fr2? 3 A Fr2 is the name of one grade of Therminol. 4 Q Do you recall that being sent to the incinerator 5 at the Krummrich plant? 6 A I remember that some Therminol was sent to the 7 incinerator. I don't remember anything specific about Fr2. 8 Q Do you know whether anything was done with Fr2 9 other than sent -- well, Therminol residues other than 10 being sent to the incinerator? 11 A No. 12 (Savage Exhibit 49 identified.) 13 Mr. Brock: Exhibit 49 is a memorandum dated 14 November 5, 1971 with Bates numbers 0248547 through 50. 15 By Mr. Brock: 16 Q Mr. Savage, is this a memorandum in which you 17 transmitted the information in Exhibit 48 to Mr. Papageorge 18 along with some other information? 19 A Yes. 20 Q This also makes a reference to the discovery that 21 the underground sewer system and sewer boxes in the area 22 were leaking very badly, and that's on the first page. Do	Page 287 1 not there was -- because this makes a reference that such a 2 cross flow being possible. Do you recall whether it was 3 determined whether in fact such a cross flow had been 4 taking place or not? 5 A No. This is the sort of problem I would have 6 expected the plant to deal with. 7 Q On the second page of Exhibit 49, this again 8 talks about, under entry of 2429, that again talks about a 9 major sewer to be installed to north. Do you know whether 10 that refers to the same project or a different project from 11 the sewer replacement project being referenced on the 12 previous page? 13 A I don't know. It sounds different but I don't 14 know. 15 Q Do you recall whether there were any types of 16 leaks or leakage discovered with respect to the -- a sewer 17 going to the north from the Aroclor operations? 18 A No. 19 (Savage Exhibit 50 identified.) 20 By Mr. Brock: 21 Q Exhibit 50 is dated July 2, 1971. 22 Mr. Savage, is this a memorandum that you

Page 288 1 received from Mr. Stewart in the ordinary course of your 2 employment at Monsanto? 3 A Yes. 4 Q B talks about " plant exit losses as measured from 5 the 24 - and 30-inch plant sewers. " Are you familiar with 6 those sewers? 7 A No. 8 Q Are you familiar with there being two separate 9 sewer systems going from the Aroclor department? 10 A No. 11 Q If you turn to the next page under " program 12 status, " it talks about a discrepancy between plant exit 13 and treatment plant influent. Do you see that? 14 A Yes. 15 Q Do you recall there being such a discrepancy in 16 the sampling results around that time? 17 A Not specifically but it's part of a general 18 pattern that we had difficulty in getting good 19 measurements. 20 Q Do you recall what was done to correct that 21 situation? 22 A Mainly it was a matter of finding more precise	Page 290 1 A I don't know. Even in 1971 I was speculating. 2 So I'd have to speculate further now. 3 Q Do you know was there an investigation to 4 determine whether or not any rise in the amount of Aroclor 5 losses from the Anniston plant could be attributed to high 6 levels of rain? 7 A I don't remember that kind of investigation. 8 Q The next page makes a reference to a " Montar draw 9 outline. " Do you know what that was? 10 A I don't remember the incident. Montar was the 11 name given to Aroclor still residue when it was sold. 12 Q Do you know what the draw outline was? 13 A Well, I can infer from the words that it was a 14 line used to remove Montar from the still, but I don't know 15 that for sure. 16 Q Do you recall any times during which the line 17 used to remove Montar from the still was unplugged? 18 A Montar was a fairly high-melting solid, so I 19 would presume that it had to be unplugged every time it was 20 used. 21 Q Do you know what the department sump pit was, the 22 Aroclor department sump pit?
Page 289 1 sampling methods. We were eventually successful in doing 2 that. 3 Q When you say that, is that the project you talked 4 about yesterday involving placing the sampling devices into 5 streams and with certain steps being taken? 6 A Yes, that was the sample project. We were taking 7 samples in a number of different places and fighting 8 similar problems in each one of those places. 9 (Savage Exhibit 51 identified.) 10 By Mr. Brock: 11 Q Exhibit 51 is dated August 5, 1971. 12 Mr. Savage, is this a memorandum that you sent to 13 Mr. Papageorge in the course of your employment? 14 A Yes. 15 Q At the bottom of the second page of the 16 memorandum under the heading for the Anniston plant, it 17 states " The month of July had an unusual amount of 18 intermittent rain which may have caused a normal flow to go 19 above 1.0 pounds per day. " Do you see that? 20 A Yes. 21 Q Why would rain cause the Aroclor losses from the 22 Anniston plant to rise?	Page 291 1 A At some point we installed a kind of interceptor 2 pit in the department sewer in the Aroclor department as a 3 way of being sure that any spill did not leave the 4 department. 5 Q Do you know when that was put in place? 6 A No, I don't remember. 7 Q Was that in place during your tenure at the 8 Anniston plant? 9 A No, it was installed during the time I was 10 manufacturing manager. 11 Q Was there an awareness in connection with the 12 installation of that, in the past, Aroclors had been 13 leaving the department? 14 A Well, by that time, we knew it from analytical 15 results, but it's my recollection that the purpose of the 16 pit was really just extra insurance so that if we did have 17 a spill, we could be better assured that that spill would 18 not leave the plant. 19 Q Do you recall there being any investigation or 20 study with respect to when Aroclors -- strike that. 21 Do you recall there being an investigation or 22 study in connection with the Anniston plant addressing a

Page 292 1 subject of how much Aroclor may have been lost from the 2 Aroclor operations there during different years or 3 different periods of time? 4 A No. 5 Q Sort of an historical -- 6 A I don't know how that could have been done 7 retrospectively. 8 (Savage Exhibit 52 identified.) 9 By Mr. Brock: 10 Q Exhibit 52 is a memorandum dated November 30, 11 1971. It has Bates numbers of 0134909 and 910. 12 Mr. Savage, is this a memorandum from Gerald 13 Bratsch to F. J. Holzapfel that you received in the ordinary 14 course of your employment with Monsanto? 15 A Yes. 16 Q Do you know what prompted this report from -- to 17 Mr. Holzapfel? 18 A No. It's a little unusual since Gerry Bratsch 19 was the plant manager. Fred Holzapfel was his boss. 20 Q Do you have an understanding as to the background 21 of this unusual type of report being called for or being 22 done?	Page 294 1 A No. 2 (Savage Exhibits 53 and 54 identified.) 3 Mr. Brock: Exhibit 53 is a memorandum dated 4 December 2, 1971, has Bates numbers 0248542 through 546. 5 Number 54 is dated December 8, 1971 with Bates numbers 6 0008737 through 740. 7 By Mr. Brock: 8 Q Mr. Savage, is Exhibit 53 a memorandum that was 9 sent to you in the ordinary course of your employment with 10 Monsanto? 11 A Yes. 12 Q And in 54 you transmitted that information along 13 with some other information to Mr. Papageorge ; is that 14 correct? 15 A Yes. 16 Q That's your handwriting on Exhibit 53? 17 A Yes. 18 Q It looks to me -- the second paragraph on 19 Exhibit 53, there's some lines through that? 20 A Yes. 21 Q That doesn't -- that language doesn't appear in 22 your transmission to Mr. Papageorge. Do you know why you
Page 293 1 A From the first paragraph, obviously Fred had 2 asked for it, but I don't know why he asked for it. 3 Q In the bottom paragraph of the first page, the 4 last sentence starts " work continues through Art's group 5 and the environmental control group. Sewer rats to pin 6 down sources as well as develop more reliable sewer 7 samples. " Do you see that? 8 A Yes. 9 Q Were you familiar with the term " sewer rats "? 10 A No. Perhaps Gerry just made it up. 11 Q Had you ever heard that term used in connection 12 with the Pcb investigations at the Krummrich plant? 13 A Not that I remember. 14 Q Do you recall anybody having responsibility for 15 going down into the sewers and investigating what was going 16 on there? 17 A No. 18 Q Do you recall Mr. Holzapfel or Mr. Bratsch asking 19 for a more overall investigation of what was going on with 20 respect to the Pcb contamination, investigations and 21 actions in addition to the reports that you were submitting 22 to Papageorge?	Page 295 1 took that out? 2 A That would have been just part of my normal 3 editing process. 4 Q In the indented paragraph on the first page of 5 Exhibit 53 there's a statement " higher losses were evident 6 early in the month when major sewer failures in the 7 department were discovered and subsequently partially 8 repaired. " Do you see that? 9 A Yes. 10 Q It goes on to say " additional measures, sewer 11 repairs are needed and should be expedited in December. " 12 Do you see that? 13 A Yes. 14 Q And that information is submitted to 15 Mr. Papageorge in Exhibit 54? 16 A Yes. 17 Q Does that refresh your recollection as to major 18 sewer failures being discovered in the Aroclor sewers 19 around that time? 20 A No. 21 Q Does that refresh your recollection as to any of 22 the repair work that was done?

Page 296 1 A No, that kind of problem could be handled by the 2 plant. There's no reason why I would have any interest 3 other than that they did it. 4 Q On the second page of Exhibit 53 under the first 5 heading it says on 11/26, " a known cross flow between the 6 main sewer was corrected so that the individual sewer 7 results are reflected on the source. " Do you see that? 8 A Yes. 9 Q Does that refresh your recollection as to there 10 in fact being a cross flow discovered between the various 11 sewers? 12 A It's consistent with my recollection that the 13 sewer system was complicated and it was therefore difficult 14 to understand the analytical results in the early days, and 15 this represents some progress on that problem. 16 Q Do you interpret that reference to mean cross 17 flows between different sewers? 18 A Yes. 19 Q I'm drawing a distinction between that kind of 20 cross flow and the cross flow, the possible cross flow that 21 was referenced in the earlier document between sewers and 22 the underground water.	Page 298 1 see that? 2 A Yes. 3 Q I should have noted that earlier. Does that 4 refresh your recollection as to a cross flow being found in 5 fact between the sewer water and the underground water? 6 A That paragraph appears to refer to a different 7 situation than the one on the subsequent paragraph. One 8 seems to make it more clear that in the second entry, the 9 one we discussed earlier, that that does refer to something 10 other than cross flow between sewer water and underground 11 water. 12 Q Does that refresh your recollection at all as to 13 cross flow between -- 14 A No. 15 Q But do you know what modifications were done to 16 the sewers in Department 246? 17 A No. 18 Q And the next reference is to " upgrade sewer in 19 Second Street. " Do you know what was done along those 20 lines? 21 A No. 22 Mr. Brock: Off the record.
Page 297 1 A The sentence is defective in that it says " a 2 known cross flow between the main sewer " and it doesn't say 3 between that and what else, but I would interpret this to 4 mean a cross flow between one sewer and another one. 5 Q Does that refresh your recollection at all as to 6 whether a cross flow between the sewers and the underground 7 water was ever discovered? 8 A No. 9 Q On the third page of Exhibit 53 under the program 10 status, there's again a reference to the Pcb task force, 11 and it says it's meeting biweekly. Do you see that? 12 A Yes. 13 Q Does that refresh your recollection as to any 14 contacts you may have had with the Pcb task force? 15 A No. 16 Q Let's stay on this page up above that, and under 17 the estimate number 3438, the first entry is " modify sewers 18 in Department 246. " Do you see that? 19 A Yes. 20 Q And that states " altered and repaired 21 departmental sewer system to eliminate cross flow of sewer 22 water and underground water within the department. " Do you	Page 299 1 (Discussion off the record.) 2 (Savage Exhibits 55 and 56 identified.) 3 By Mr. Brock: 4 Q Exhibit 55 is dated January 4, 1972. Bates 5 numbers 0248700 through 702. Exhibit 56 is dated January 6 13, 1972 with Bates numbers 0008693 through 696. 7 Mr. Savage, is Exhibit 65 a January 4, 1972 8 memorandum that you received in the course of your 9 employment with Monsanto? 10 A Yes. 11 Q And in Exhibit 56 you transmitted that 12 information along with some other information to 13 Mr. Papageorge ; correct? 14 A Yes. 15 Q And at the bottom of the first page of Exhibit 16 55, the January 4, 1972 memorandum, there's a reference 17 again to extensive sewer repair work, the progress in the 18 department to better control Pcb losses within the system. 19 Does that refresh your recollection as to any such repair 20 work being done? 21 A No. 22 Q If you go to the next page, entry number 1.

Page 300 1 A Yes. 2 Q It talks about " diversion of the sewer streams 3 from the Aroclor department such that all department flow 4 was directed to the north and not permitted to flow into 5 the internal plant sewer system which exits at the 24-inch 6 and 36-inch sewers. " Do you see that? 7 A Yes. 8 Q Can you explain to me what that means? 9 A No, I can't add anything to what it says there. 10 Obviously, they were doing some kind of a test to try to 11 analyze the sewer flows, but I don't recall any further 12 detail about it. 13 Q And does that refresh your recollection as to 14 what the sewer directed to the north was? 15 A No. 16 Q Let's go to the Exhibit 56, page 3 of that. 17 Under the heading for the Anniston plant where it says " the 18 total Aroclor losses " -- or it gives figures for them and 19 then it says " the Aroclor losses " -- it makes reference to 20 them being reported to the Epa and the state of Alabama. 21 Do you see that? 22 A Yes.	Page 302 1 A As far as I remember there was no difference. 2 Q Do you recall there being any discussions about 3 whether to report these matters to Monsanto's insurance 4 companies? 5 A I have no idea. There's no reason why I would 6 have been involved in that. 7 (Whereupon, at 12: 50 p. m. , the deposition was 8 recessed, to be reconvened at 2: 00 p. m. this same day.)
Page 301 1 Q Do you recall the reasons that those Aroclor 2 losses from the Anniston plant were reported to the Epa and 3 the state? 4 A They had a particular methodology that they 5 specified relating to certain of the individual homologues 6 in Aroclor ; that is, the particular chemical species in 7 Aroclor. That methodology gave different numbers than what 8 we would have defined as total Pcb's, total Aroclor. 9 Q When you say " they specified, " who do you mean? 10 A Epa. 11 Q Do you know whether the results of the Pcb 12 testing at the Krummrich plant were reported to the state? 13 A No, I don't know. 14 Q What about the Epa? I meant to include that. 15 A Well, I presume that anything we did with the 16 federal Epa with respect to the Anniston plant would have 17 also been done for the Krummrich plant, but I don't 18 remember specifically how that reporting was done. 19 Q Do you recall whether there were any discussions 20 concerning whether the testing done at Krummrich should be 21 handled differently from the testing done at Anniston with 22 respect to reporting to the governmental agencies?	Page 303 1 Afternoon Session (2: 05 p. m.) 2 Whereupon, 3 James R. Savage 4 resumed the stand and, having been previously duly sworn, 5 was examined and testified further as follows: 6 Examination (Continued) 7 (Savage Exhibits 57 through 84 8 identified.) 9 By Mr. Brock: 10 Q During the lunch break, I had a number of 11 exhibits marked. And the first is Exhibit 57, which I 12 meant to give to you earlier, actually. We couldn't find 13 it at the time. For the record, the Bates numbers are 14 Ann 1539108 and 109. 15 Mr. Savage, is this a memorandum that you 16 received in the course of your employment with Monsanto? 17 A It appears to be, but it's incomplete. I only 18 have one page of it here. There must be a second page. 19 Mr. Burnett: My copy has two pages. 20 (Discussion off the record.) 21 The Witness: Yes, this is a memo from John 22 Mullendore.

Page 304 1 By Mr. Brock: 2 Q In the second paragraph it references a call from 3 Jim Standridge and it says he asked " what is Monsanto doing 4 to us. The mayor has received numerous calls on the odor 5 at the treatment plant. More lawsuits will be filed. " Do 6 you see that? 7 A Yes. 8 Q Are you aware of any lawsuits that have been 9 filed concerning odor at the waste treatment plant, other 10 than the lawsuit you mentioned yesterday about the damage 11 to the paint on people's houses? 12 A No, I'm not aware of any lawsuit like that. 13 That's, again, not something I would have known about 14 necessarily. 15 Q Down below there's a paragraph " I picked up Jim 16 Savage on the way to the treatment plant since the 17 complaint sounded serious and this was the first one we had 18 received in several months. " Do you see that? 19 A Yes. 20 Q First of all, do you recall receiving complaints 21 about the odors from the treatment plant at or about this 22 time?	Page 306 1 responsibilities at that time? 2 A That's right. 3 Q At the bottom of the second page, the last two 4 sentences, it states " To prevent a recurrence, these solids 5 should be sent to the sewer gradually over an extended 6 period of time at a rate that will not cause objectionable 7 odors at the treatment plant. The method for doing this 8 will be discussed with Savage and Studz during the latter's 9 visit of January 6. " 10 Do you recall addressing or discussing that 11 subject -- 12 A No. 13 Q -- around this time frame? 14 A No. 15 Q Do you recall addressing that subject -- strike 16 that. 17 Addressing around this time frame the subject of 18 how best to eliminate odors from the waste treatment plant? 19 A No. 20 Q Let's go to Exhibit 58. Is this a January 1972 21 memorandum, a copy of which you received in connection with 22 your employment with Monsanto?
Page 305 1 A No, I don't remember this incident. 2 Q Whether or not you remember this specific 3 incident, do you recall as a general matter there being 4 complaints about the odors from the waste treatment plant 5 during your early years at the Anniston plant? 6 A I don't remember anything specific about odors at 7 the treatment plant. 8 Q The statement " this was the first one we had 9 received in several months, " do you recall there being 10 complaints typically within the space of several months of 11 each other concerning -- 12 A No. 13 Q Do you recall discussing with Mr. Mullendore or 14 Mr. Standridge or Mr. Edelblut the subject of whether 15 lawsuits were likely to be filed concerning odor at the 16 waste treatment plant? 17 A No. 18 Q Was there someone at the Anniston plant who would 19 have been responsible for helping put together Monsanto's 20 response with respect to any such lawsuits? 21 A I don't know. 22 Q I take it that was not one of your	Page 307 1 A Yes. 2 Q It starts with the comment " We have reviewed the 3 existing sampling system to control Pcb losses within the 4 plant and to provide historical data related to the 5 effectiveness of the Pcb control program. " Do you see 6 that? 7 A Yes. 8 Q Do you recall there being an effort to go back 9 and provide historical data concerning the effectiveness of 10 the Pcb control program? 11 A This is written in 1972. To my knowledge the Pcb 12 program, the control program had been in effect for perhaps 13 three years at the most. So historical would have only 14 been within that context. 15 Q Do you recall any effort to go back and provide 16 historical data with respect to Pcb emissions dating back 17 further than that? 18 A No. 19 Q Do you recall any discussions about whether or 20 not there should be an effort made to investigate further 21 back than that? 22 A No.

Page 308 1 Q Do you have an understanding as to why this was 2 sent to Art Leisy? 3 A I think Art Leisy was the production 4 superintendent at that time. I'm not sure, but I think so. 5 Q I'm curious because it seems that a lot of the 6 memos have been from Engman and Stewart to you, and you 7 forward the information to Papageorge. 8 A That's right. 9 Q This seems to be a separate -- at least a 10 separate direction and I'm curious as to why this -- do you 11 have an understanding as to why this type of information 12 would have been sent to Leisy rather than to you and 13 Papageorge? 14 A No, I don't. 15 Q Let's go to Exhibit 59 which is dated February 2, 16 1972. And, again, is this a memo to you that you received 17 in the course of your employment with Monsanto? 18 A Yes. 19 Q Under the letter -- the indented paragraph 20 lettered A there's a reference to " discontinuance of 21 routine sampling from the Aroclor department. " Do you see 22 that?	Page 310 1 A Yes. 2 Q Were variations like that something that would 3 have caught your attention during that time? 4 A It does seem anomalous. I don't remember this 5 particular occasion, but it's the kind of thing that would 6 have caught my attention at the time. 7 Q Do you recall there being variations like that or 8 of that magnitude? 9 A Yes. 10 Q Do you recall investigations into the reasons for 11 that, for such variations other than addressing sampling 12 accuracy? 13 A We would always attempt to investigate the reason 14 for the variation, and sometimes it would be due to some 15 abnormal condition in the plant. 16 Q The next paragraph states that higher than normal 17 losses from the department are attributed primarily to two 18 causes. And the first, it says " Aroclor 1105 was produced 19 until 2/7 and during this period all of the off gas was 20 sewered. " How would that result in higher than normal 21 losses of Aroclor from the department? 22 A Because the off gas contained some Pcb, and
Page 309 1 A Yes. 2 Q Do you recall sampling being discontinued from 3 that department in or around this time frame? 4 A No, but this entire paragraph is consistent with 5 what I've said before, that we discovered our sampling -- 6 our sample gathering systems were not as effective as they 7 should be. We eventually changed to more effective 8 methods. 9 Q Was there any reason that you recall for the 10 discontinuance of the sampling besides sampling accuracy? 11 A No. 12 Q Was there a time during which samples were not 13 taken? 14 A I don't remember that there was. There may have 15 been. 16 Q Let's go to Exhibit 60 and start off with -- is 17 it a March 3, 1972 memorandum that you received in the 18 course of your employment with Monsanto? 19 A Yes. 20 Q The first paragraph contains a reference stating 21 that " The February losses from the plant were about 3-1/2 22 times greater than the previous month. " Do you see that?	Page 311 1 normally that did not go to the sewer. 2 Q Was the production of Aroclor 1105 discontinued? 3 A Aroclor 1105 was not a routine product. There 4 were a couple of unusual materials that were made on a test 5 basis during this period, 1105 being one of them. And in 6 each case, it was a special run to produce test quantities 7 of a different product. As far as I know, neither of those 8 became regular products, but I don't know whether there was 9 ever another 1105 run after this one or not. 10 Q Later it states " also during the period 2/7 and 11 2/19 excess off gas was sewered at Department 246 area. " 12 What does that refer to, specifically the -- strike that. 13 Do you have an understanding as to why excess off 14 gas would have been sewered from that area? 15 A Well, the implication of excess is that more off 16 gas was being produced than could be consumed in the using 17 department, so it had to go somewhere. 18 Q Was that a frequent occurrence? 19 A No, at this time I don't think it was frequent at 20 all. 21 Q Do you have an understanding or belief as to how 22 often that would take place?

Page 312 1 A My recollection is that it was rare by this time, 2 but I can't quantify that. 3 Q When you say " rare, " would it have been more than 4 once a year or less than once a year? I'm just trying to 5 put some general parameters on it. 6 A Certainly less than once a month, but perhaps 7 more than once a year. 8 Q Let's go to Exhibit 61. Is that an April 4 -- it 9 appears to be 1972. Well, is this a memorandum that was 10 directed to you during the course of your employment with 11 Monsanto? 12 A Yes. 13 Q Can you read the second indented paragraph to 14 yourself and let me know when you've had a chance to do 15 that. 16 A The one beginning " routine pollution control " ? 17 Q That's right, yes. 18 (Witness reviewed the document.) 19 A Okay. 20 Q There's a reference to an emission investigation, 21 and that's in quotes and it's also capitalized. Do you see 22 that?	Page 314 1 Q Do you know whether it was ever determined when 2 those materials had leached or may have leached from the 3 adjacent ground area? 4 A No. 5 Q The term " leach, " did you understand that to 6 relate to a more gradual process than -- do you have an 7 understanding that that relates to a gradual process? 8 Mr. Burnett: I object to the form of the 9 question. Vague. Go ahead. You can answer it if you can. 10 The Witness: The term " leaching " is a common 11 term in chemical engineering which usually refers to 12 contact of a liquid with a solid during which some material 13 is dissolved out of the solid into the liquid. If leaching 14 is carried out as a deliberate process, it might be pretty 15 rapid, but leaching from the ground might also be fairly 16 slow. 17 By Mr. Brock: 18 Q You don't have -- do you have any reason to 19 believe this was carried out as a deliberate process? 20 A No. 21 Q And the leaching from a normal -- or from a 22 natural process would typically be slower than deliberate
Page 313 1 A Yes. 2 Q Was that a particular term that was used within 3 Monsanto? 4 A I think it's analogous to an accident 5 investigation, but I don't remember the term specifically. 6 Q Do you recall there being excavations in the new 7 Pna area around that time? 8 A I remember that there was construction to build a 9 new Pna plant, which construction would normally include 10 excavation. 11 Q Did you have any responsibilities relating to the 12 construction of the new Pna plant? 13 A No. 14 Q There's a statement " these waters contain Pcb 15 leached from the adjacent ground area. " Do you see that? 16 A Yes. 17 Q Do you recall there being any investigation into 18 how those Pcb's had leached from the adjacent ground area? 19 A No. 20 Q Did you have an understanding as to how those 21 Pcb's had leached from the adjacent ground area? 22 A I don't remember anything about it.	Page 315 1 leaching? 2 A No. 3 Q It would depend upon how fast they wanted the 4 deliberate leaching to take place ; right? 5 A It would depend on a lot of physical parameters. 6 Temperatures and concentrations and so forth. 7 Q Do you know what the adjacent ground area around 8 the Pna area, the new Pna area consisted of? 9 A It's my recollection that the new Pna department 10 was built in an area fairly remote from the Aroclor 11 department, but since I was not directly involved in the 12 project, I can't pinpoint the place. 13 Q Let's go to Exhibit 62. Again, is this a 14 memorandum, a copy of which was directed to you during the 15 course of your employment with Monsanto? 16 A Yes. 17 Q For the record, the date on it is April 6, 1972. 18 Can you read the first paragraph to yourself, and 19 let me know when you've had a chance to do that. 20 (Witness reviewed the document.) 21 A Okay. 22 Q Do you recall there being a discussion or concern

Page 316 1 about the subject of the Office of Science and Technology, 2 perhaps recommending that Pcb levels and effluent streams 3 be virtually reduced to zero? 4 A My recollection is more vague and general than 5 that. I don't have any recollection about what part of the 6 federal government would be making new recommendations or 7 what specific targets it would recommend, but I do remember 8 increasing the likelihood of federal regulation. 9 Q Do you recall being aware of the possibility 10 that -- or the concern that the federal government would 11 recommend that Pcb levels in streams be reduced virtually 12 to zero? 13 A I think we expected very low -- that very low 14 levels would be tolerable, and the numbers were not of 15 great significance to the actions that we were taking at 16 the time because we were doing everything we could to 17 eliminate every loss we could identify. 18 Q Why did you expect the numbers to be very low? 19 A There appeared to be a strong public concern and 20 a concern in the federal government about Pcb's, and we 21 simply expected that we would have to meet various 22 difficult targets.	Page 318 1 A I think there's a substantial amount of 2 speculation on Ed's part in this statement. I have no idea 3 how he arrived at that number. The general idea that there 4 might be residual Pcb in the soils that would continue to 5 be leached into the sewers for a period of time was no 6 particular surprise, but I don't know how that could have 7 been quantified. 8 Q Why do you say that was no particular surprise? 9 A Because in our analytical program, we had by this 10 time determined that the amount from assignable sources was 11 smaller than the total amount leaving the plant. 12 Q Do you know what the ratio was generally? 13 A No, I don't remember. 14 Q And again, page 4 of this, the page with the 15 number 4, again makes a reference to measure repair to main 16 sewer from department to eliminate cross flow of 17 groundwater. And again, does that refresh your 18 recollection at all as to that type of repair being done or 19 that type of cross flow existing? 20 A No, I don't remember it. 21 Q Let's go to Exhibit 63. Is this a memorandum 22 that was directed to you during the course of your
Page 317 1 Q Was there discussion about what would happen if 2 the standards were set very low and Monsanto wouldn't be 3 able to reach those standards? 4 A I don't know that we spent a lot of time 5 concerning ourselves as to exactly what sanctions would be 6 levied against us. We simply felt that we had to do the 7 best we can because we could expect very strict 8 regulations. 9 Q Do you recall whether the subject of the 10 possibility of a lawsuit or lawsuits was ever discussed in 11 that regard? 12 A No, not specifically. I think our feeling was 13 that we could expect strong regulation and that if we 14 wanted to stay in business, we should simply do everything 15 that we could. 16 Q On page 2 at the very top there's a statement " it 17 is conceivable and highly probable that residual Pcb in 18 Wgk's soil and sewers will continue to be leached for 19 months to come. This amount could approach a daily average 20 of five pounds per day. " Do you see that? 21 A Yes. 22 Q Was that your understanding at the time?	Page 319 1 employment with Monsanto? 2 A A copy of it was directed to me. 3 Q I've seen a lot of references to this document 4 and in documents dated later. Do you recall this report 5 from Engman to Bratsch being considered a significant event 6 at the Krummrich plant? 7 Mr. Burnett: Object to the form of the 8 question. 9 Go ahead. 10 The Witness: This just seems to be another step 11 in the program which several projects are summarized in the 12 attachment. 13 By Mr. Brock: 14 Q Do you recall the plant manager making a request 15 to be -- a request for there to be such a summary of all 16 the Pcb-related projects? 17 A No, but it's part of the plant that he was 18 responsible for so it's not unreasonable that he would ask 19 for such a report. 20 Q Let's go to the attached chart, the categories of 21 sources, sources of loss. Did you consider those to be 22 routine losses from the Aroclor department during that

Page 320 1 time? 2 Mr. Burnett: Object to the form of the 3 question. Vague and ambiguous. 4 The Witness: Would you repeat the question. 5 By Mr. Brock: 6 Q Did you consider those to be routine losses from 7 the Aroclor department around that time? 8 A The first one -- 9 Q Routine losses of Aroclor from the plant at that 10 time? 11 A The first one, in fact, was a fairly rare 12 situation because it refers to losses when the gas was 13 drowned, and that was abnormal and did not happen very 14 often. 15 Q But that was -- I'm sorry. 16 A The others are ongoing losses of one kind or 17 another. 18 Q When you say when the gas was drowned, that was 19 something that Monsanto would do intentionally ; correct? 20 A Well, when the action was taken, it would be 21 taken intentionally, but the policy was that this was not 22 to be the way to operate.	Page 322 1 they would be sent to the sewer, was that its function? 2 A I think that you're referring to an answer I gave 3 you about Anniston, whether there was a similar basin for a 4 similar purpose. 5 Q Okay. Can you describe for me the way that the 6 settling basin was set up. First of all, was it a settling 7 basin in connection with the Aroclor department? 8 A That's what I recall. 9 Q Can you describe for me what it consisted of? 10 A I don't remember that one. I remember it as 11 being similar to the Anniston one, but I can't recall what 12 it looked like or anything like that. 13 Q Do you know how big it was? 14 A No. 15 Q If you go to the pages with the Bates numbers 247 16 through 251, you can see that there are certain projects 17 listed, and they're divided up between production, 18 maintenance and technical services. Do you see that? 19 A Yes. 20 Q How was that type of division made, meaning 21 concerning who -- 22 A Just according to the capabilities of the various
Page 321 1 Q Let's go to Exhibit 64. For the record, it's 2 dated May 2, 1972. 3 Is this a memorandum that was directed to you 4 during the course of your employment with Monsanto? 5 A Yes. 6 Q At the bottom of page 2, there's a reference to a 7 project being prepared to pump from north settling basin to 8 the south unit. Do you see that? 9 A Which page? 10 Q The second page of the document. At the bottom. 11 A Okay, yes. 12 Q Do you know what the north settling basin was? 13 A No. 14 Q Do you know what the south unit was? 15 A No, by this time we had some kind of settling 16 basin in the department, but I don't remember that it had 17 more than one compartment or anything like that. 18 Q Do you know when that settling basin was 19 constructed? 20 A No. 21 Q I thought you described that -- and you can 22 correct me if I'm wrong -- as settling out materials before	Page 323 1 groups, things like routine operation, making measurements 2 and taking samples would more likely be done by production, 3 whereas technical work or project work would more likely be 4 done by technical services. Installation was always done 5 by the maintenance department. 6 Q If you look on the last, or the page that ends in 7 Bates number 250 under the maintenance section, there's a 8 reference to " repair sewer at Second Street. " Do you see 9 that? 10 A Yes. 11 Q Do you know what that sewer refers to? 12 A No. 13 Q Do you know whether -- we've seen some sewers 14 referenced earlier, that reference to the sewers in the 15 Aroclor department. Do you know whether this is a separate 16 sewer or the same? 17 A No, I don't. 18 Q Let's go to Exhibit 65. Is this a July 7, 1972 19 memorandum directed to you during the course of your 20 employment with Monsanto? 21 A Yes. 22 Q In the reference to Aroclor department in A,

Page 324 1 there's a reference to new sewer and sampling station and 2 operation 622. 3 A Yes. 4 Q Did you continue to visit the Aroclor operations 5 at the Krummrich plant around this time? 6 A Yes. 7 Q Was a new sewer and sampling station there, was 8 that something that you would have visited? 9 A Probably not a sewer project, but I would have 10 been interested in a sampling system. We had regular 11 meetings at the plant, in the plant office, and if there 12 was significant progress on projects, I would typically go 13 out in the plant and look at it. 14 Q If there were -- why would you not have been 15 interested in the new sewer? 16 A Because it wasn't anything that I could do 17 anything about. It was other people's responsibility. 18 Q You couldn't say the sewer should be fixed? 19 A Oh, if there was a defective sewer and the 20 problem was not being dealt with properly by the plant, I 21 would have certainly been in a position to complain about 22 that and insist that it get attention. But as long as it	Page 326 1 you can see that that references the earlier document that 2 went from Engman to Bratsch. Do you see that? 3 A Yes. 4 Q Do you recall there being any type of meetings or 5 discussions around that time involving Engman and Bratsch 6 concerning how to go about addressing the Pcb situation 7 from that time on? 8 A No. 9 Q The next page, the page that ends in Bates number 10 689, makes a reference to " activities in progress to 11 assemble desired information, formally programmed for 12 dealing with federal authorities in the near future with 13 regard to Pcb's in the environment. " Do you see that? 14 A Yes. 15 Q Other than the materials that you were sending, 16 receiving from the Krummrich plant and then sending to 17 Papageorge, were you involved in any attempts to assemble 18 information for dealing with federal authorities on that 19 issue? 20 A I may have been requested to do that, but I don't 21 remember it. 22 Q You don't recall any particular type of
Page 325 1 was being dealt with by the proper people, it's not 2 something that really concerned me. 3 Q In the first paragraph under " Pcb levels in 4 sewers, " there's a reference to " knowing losses, " do you 5 see that? 6 A Yes. 7 Q And that same reference is made on the next page, 8 and again it says " knowing losses. " It's the first 9 paragraph. Again, it's in quotes. Do you know why that -- 10 I guess why you put that in quotes? 11 A Well, this is a letter to me. 12 Q I'm sorry. Do you know why that was put in 13 quotes? 14 A Because it was an unusual term and it seems an 15 unusual choice of words. I don't know why they used those 16 words. I would have used a term like identified losses. 17 Q Does that refer to losses that Monsanto knew 18 about and had identified? 19 A Yes, and my interpretation of this is these are 20 losses where we identified a source, presumably we were 21 working on it. 22 Q And under the lii where it says " program status, "	Page 327 1 information you were requested to get? 2 A No. 3 Q Let's go to Exhibit 66. Is this a copy of a 4 December 1, 1972 memorandum that was sent to you in 5 connection with your employment with Monsanto? 6 A Yes. 7 Q Do you know whose writing that is up at the top? 8 A Looks like mine. 9 Q Number 2 appears to read " Srs file Aroclor 10 pollution. " 11 A " Jrs file. " 12 Q What was that? 13 A That was my file. This would have been 14 instructions to my secretary ; number one, make a copy for 15 Bill Papageorge and number two, put this in my file. 16 Q Does that refresh your recollection as to keeping 17 a file concerning Aroclor pollution situation? 18 A I would probably have had a file about that, but 19 I don't remember it specifically. This does indicate that 20 I did have such a file. 21 Q Let me ask you to turn to the third page of the 22 document. It's the page with the Bates number 376. Under

Page 328 1 " Wgk strategy " it states " no plans to contact Epa until 2 Pcb is declared toxic substance. " Do you see that? 3 A Yes. 4 Q Do you know how that decision was arrived at? 5 A No, and it seems a little strange to me that 6 Mr. Stewart would be commenting about that since that was 7 not a plant matter. 8 Q How would it be decided or how would it have been 9 decided within Monsanto around that time whether to contact 10 the Epa with regard to the Pcb situation at Krummrich? 11 A That kind of a decision would be taken somewhere 12 above my level. 13 Q Who would have -- when you say above your level, 14 do you have any particular people in mind? 15 A I would expect that Mr. Bergen and Mr. Papageorge 16 and some of our attorneys would be involved, perhaps 17 others, perhaps the division general manager. 18 Q Who was the division general manager? 19 A I'm not sure. When I joined the business group, 20 John Mason was the general manager. At some point he was 21 replaced by Mr. Corey, but I'm not sure which one would 22 have been on the job at this particular time.	Page 330 1 governmental authorities concerning Pcb matters at the 2 Anniston and Krummrich plants? 3 A No. 4 Q Let's go to Exhibit 67. Is that a copy of a 5 February 7, 1973 memorandum that was directed to you in the 6 course of your employment with Monsanto? 7 A Yes. 8 Q Can you read the first paragraph of that to 9 yourself and let me know when you've had a chance to do 10 that. 11 (Witness reviewed the document.) 12 A Okay. 13 Q Do you know why starting in February of 1973 the 14 status of the Pcb environmental control program was to be 15 reported by the environmental control group at the 16 Wgk plant? 17 A No. 18 Q Do you recall a change as to who would be 19 reporting being instituted? 20 A No, I don't remember. 21 Q Who was J. Grant, G-r-a-n-t, his name is up above 22 next to Art Leisy?
Page 329 1 Q What was Mr. Corey's first name? 2 A He was called Wink. I think his initials were 3 W. R. I don't know what his real name was. 4 Q Are you aware of any discussions around this time 5 concerning the subject of whether the Epa should be 6 contacted with regard to the Pcb situation at Krummrich? 7 A No, I should point out incidental to that there's 8 also an Illinois Epa and that this plant is in Illinois so 9 this statement is perhaps ambiguous to that extent. 10 Q Right. And I guess when I'm referring to Epa, 11 I'm referring to the federal Epa -- or the state Epa? 12 A Right, and I don't know which of these 13 Mr. Stewart might have been referring to. 14 Q Do you know whether there was any instruction 15 given to the effect of Mr. Stewart's statement in the memo? 16 A No. 17 Q Do you have any reason to believe that that 18 statement is not accurate as of the writing -- as of the 19 time of this memo? 20 A I have no idea about it one way or the other. 21 Q Does this refresh your recollection at all as to 22 any type of different handling of contacts with	Page 331 1 A I don't remember who that is. 2 Q Do you know who D. C. Otto was? 3 A That's Don Otto. I remember him as being the 4 head of the personnel department and if that's so, I have 5 no idea why he has a copy. 6 Q Did you attend plant strategy meetings concerning 7 the strategy for the Krummrich plant's dealing with the Pcb 8 situation? 9 A I don't know that we had meetings that were 10 called strategy meetings. We had planning meetings when we 11 would decide what was to be done. I don't remember using 12 the word " strategy " to describe plant meetings. 13 Q On the third page, the reason I asked the 14 question that way, on the third page under Wgk strategy, it 15 just starts off, it states " plant strategy meeting to be 16 held again when additional information is received from 17 Epa. " And then it goes on. Do you recall attending 18 meetings of that type? 19 A I have attended meetings that could be described 20 that way. I don't remember using the word strategy to 21 describe them but that's not an unreasonable way to 22 describe them.

Page 332 1 Q Fair enough. Who would be at those meetings 2 typically? 3 A Well, by this time Clarey Buckley, probably Art 4 Leisy. Paul Heisler, I think, had responsibility for 5 overall plant pollution matters by that time, at least at 6 some time he got that responsibility. Probably the 7 department supervisor would be there, who I think at that 8 time was Bob Mccutchan and perhaps Engman or some of the 9 Tsd engineers who were working in the area. 10 Q Do you recall the subject of possible claims or 11 lawsuits against Monsanto with respect to the Pcb situation 12 coming up at any of those meetings? 13 A Not plant meetings, no. 14 Q When you say not plant meetings, do you recall 15 that coming up in some other kind of meeting? 16 A Well, in meetings of the business group, 17 sometimes people would mention things like the silo 18 lawsuit. 19 Q And the silo lawsuit was what again? 20 A The silo lawsuit was a case in, I think in Ohio 21 where a silo had been coated with material that had Pcb in 22 it. And it was alleged that the milk from the cows that	Page 334 1 the course of your employment with Monsanto? 2 A Yes. 3 Q Where it says " file Aroclor pollution " up at the 4 top, is that your writing? 5 A Yes. 6 Q Let's turn to the second page under " disposal of 7 Aroclor drums, " where it states " the contractor's operation 8 was inspected. " Do you see that? 9 A Yes. 10 Q Do you know what contractor that refers to? 11 A I'm not sure but I'm only aware of at the time 12 one contractor who did drum reconditioning. I don't 13 remember the name of it but there was a company to the 14 south of downtown St. Louis that was in that business. 15 Q Okay, you mentioned drum reconditioning and this 16 references disposal of Aroclor drums. 17 A Yes, that's right. And perhaps this is something 18 different than what I'm thinking of, but I don't know of a 19 drum disposal contractor. 20 Q Number 3 on that same page, talking about " Pcb 21 residual levels, samples have been obtained at Anniston and 22 analysis is in progress. " Do you see that?
Page 333 1 had eaten from that silage was contaminated. 2 Q Let's go to Exhibit 68. Is that a March 2, 1973 3 memorandum directed to you during the course of your 4 employment with Monsanto? 5 A Yes. 6 Q If you'd turn to the second page, you can see 7 that the name of a J. A. Munoz, Julio Munoz has been added, 8 do you see that? 9 A Yes. 10 Q Do you recall him coming on to work? 11 A Yes, as I recall he was a technician, perhaps an 12 engineer who reported to Clarey Buckley. 13 Q Do you recall what he did in connection with the 14 Pcb environmental control program? 15 A I think he helped with sampling programs and the 16 like. 17 Q Do you recall having any dealings with him on the 18 subject? 19 A I remember that I knew him but I don't remember 20 what passed between us. 21 Q Let's go to Exhibit 69. You've got a copy of an 22 April 5, 1974 memorandum which was directed to you during	Page 335 1 A Yes. 2 Q Do you recall there being an analysis of Pcb 3 residual levels in connection with the Anniston plant? 4 A I don't remember what that means. 5 Q I thought you earlier had explained what your 6 understanding of what residual Pcb's were. 7 A Well, that requires a little more context than 8 what this sentence gives me. I don't know what it means 9 without any context. 10 Q Let's go to Exhibit 70. Is this a September 20, 11 1974 memorandum that was directed to you during the course 12 of your employment with Monsanto? 13 A Yes. 14 Q Who is A. Gallion, G-a-l-l-i-o-n, who's 15 referenced in the right-hand column? 16 A I remember that name, but I can't connect it with 17 anything else. 18 Q Do you know what the A, what his first name was? 19 A I remember it was something like Arley or Arnie 20 but again, I can't make any more connection than that. 21 Q Under " program status " there's a reference or 22 there's a sentence which reads that " sewer system appears

Page 336 1 to smooth out the peaks and valleys from the department 2 losses to some extent. " First of all, do you see that 3 reference? 4 A Yes. 5 Q Can you explain what that means to me? 6 A Well, the wording is a little obtuse. My 7 interpretation would be that whatever improvements had been 8 made to sewers had reduced the variability in losses. 9 Q Why would the improvements in the sewers have 10 reduced the variability in losses? 11 A In my view it would have reduced the variability 12 in the measured losses simply because the measurements were 13 more meaningful. 14 Q Let's go to Exhibit 71. Is this a copy of an 15 April 28, 1972 memorandum which was sent to you along with 16 an attachment? 17 A Yes. 18 Q And the arrow indicates that this was a copy that 19 was directed to you ; is that correct? 20 A That's right. 21 Q And is that your writing up in the top right-hand 22 corner?	Page 338 1 A I can't comment on this meeting specifically. 2 Our policy in general was to try to maintain open 3 communication with the regulatory agencies and tell them 4 what we knew about the problem. 5 Q Were you ever contacted to give information in 6 connection with the meeting between Monsanto personnel and 7 Epa personnel? And I'm including the Illinois Epa. 8 A I don't recall ever being -- ever participating 9 in such a meeting or being requested to do so. 10 Q Who was K. Warren Easley? He's referenced in 11 Monsanto's Washington office. 12 A I think he was the head of the Monsanto 13 Washington office at the time or at least that's where his 14 office was. 15 Q Was that just an office facility or were there 16 production operations ongoing there? 17 A There weren't any production facilities there. 18 The Washington office existed as a convenience for handling 19 various contacts with the government. The only contact 20 that I had with the Washington office routinely was for 21 help in getting visas and that sort of thing. 22 Q There's a reference to a " task force for Pcb
Page 337 1 A Yes. 2 Q On the second page of the exhibit there's a 3 reference to a meeting of April 13, 1972 in the Epa offices 4 in Washington, D. C. Do you see that? 5 A Yes. 6 Q Can you read the paragraph down below of 7 " background of meeting " to yourself and let me know when 8 you've had a chance to do that. 9 (Witness reviewed the document.) 10 A Okay. 11 Q Do you recall there being a meeting between 12 Monsanto and the Epa personnel in or about April of 1972 13 concerning the Pcb situation? 14 A I was aware that Monsanto met with various 15 government officials from time to time, and I was probably 16 aware of this meeting at the time but I don't remember this 17 meeting specifically. 18 Q Do you have an understanding as to who initiated 19 this meeting, the Epa or Monsanto? 20 A No. 21 Q Do you have an understanding as to why this 22 meeting was initiated?	Page 339 1 with representatives from various federal agencies, 2 including Fda, Epa, Usda and coordinated through the office 3 of science and technology. " Do you see that? 4 A Yes. 5 Q Do you recall ever having any dealings with any 6 people on such a task force? 7 A Not that I recall. 8 Q Did you ever deal with the Fda or the Usda 9 concerning Pcb matters? 10 A I don't think so. 11 Q Did you ever deal with them concerning 12 operations -- concerning Monsanto operations? 13 A No. 14 Q On pages 3 and 4 it references comments that were 15 made by various people at the meeting and it talks about 16 Art Leisy and Dick Blowers and on page 4, it talks about 17 Bill Engman and Dr. Buckley. Do you see that? 18 A Yes. 19 Q Do you recall speaking with any of those people 20 about an upcoming Epa meeting concerning the Pcb situation? 21 A No. 22 Q Let's go to Exhibit 72. Is this a copy of a May

Page 340 1 30, 1972 memorandum that was directed to you and others 2 concerning Epa policy on Pcb's? 3 A Yes. 4 Q Do you recall receiving guidelines concerning the 5 Epa's policy with respect to Pcb's? 6 A No, I don't remember this. 7 Q There's a statement, this is in the third 8 paragraph in the first page, " I also suspect that the Epa 9 will use available legal means, such as grand juries to 10 obtain customer information from Monsanto to identify 11 potential Pcb polluters. " Do you see that? 12 A Yes. 13 Q Do you recall there being concern about the Epa 14 using legal means such as grand juries to identify 15 potential Pcb polluters? 16 A No, I don't remember a concern about that. 17 Q The memo ends with the statement " note that Epa 18 is aware and will consider the effects of residual Pcb due 19 to past losses. " Do you see that? 20 A Yes. 21 Q Do you recall being informed that the Epa would 22 go back and take a look at past losses in addition to	Page 342 1 the business group, including the products that contained 2 Pcb's, so he had responsibility for all the customer issues, 3 customer contacts, concerns that customers might have. 4 Q And who was E. V. John? 5 A I think he was an attorney. 6 Q Do you know what his first name was? 7 A Ed, I think. 8 Q Do you know whether he specialized in any area of 9 law, for example, environmental law? 10 A I only remember his name. I don't remember him 11 personally or what he did. 12 Q And P. S. Park, that's Phocion Park ; is that 13 correct? 14 A Phocion Park, Monsanto attorney. 15 Q Do you recall why lawyers were brought into this 16 matter around this time? 17 A Well, obviously there were legal issues, 18 regulation. 19 Q Does that refresh your recollection at all as to 20 discussion or consideration given to the possibility of 21 claims or lawsuits being asserted against Monsanto? 22 A No.
Page 341 1 reducing the standards for ongoing Pcb losses? 2 A Not in terms of trying to quantify anything. 3 That would be an unreasonable thing to try to do since we 4 couldn't do it, I don't know how they could do it. 5 Q Do you recall being -- putting quantities aside, 6 do you recall being informed that the Epa was -- or do you 7 recall discussions concerning whether the Epa would take 8 some type of action with respect to past Ep -- past Pcb 9 losses? 10 A No. 11 Q Who is T. L. Gossage? 12 A Tom Gossage was our director of marketing at that 13 time in the business group, reporting to Howard Bergen, who 14 is now chairman of the board of Hercules. 15 Q Is that here in Wilmington? 16 A Yes. 17 Mr. Brock: Off the record. 18 (Discussion off the record.) 19 By Mr. Brock: 20 Q Do you know what his involvement was in 21 addressing the Pcb situation at Monsanto's plants? 22 A He had responsibility for all of our marketing in	Page 343 1 Q Do you recall what you did with this information, 2 if anything? 3 A I don't recall specifically and I don't see 4 anything in this document that was inconsistent with the 5 plans that we already had in place. 6 Q Let's go to Exhibit 73. Is this a copy of a 7 June 1, 1972 memorandum that was sent to you in the course 8 of your employment with Monsanto, sent to you and some 9 others? 10 A Yes. 11 Q On the second page, the last paragraph reads 12 " strategy for dealing with federal authorities in the near 13 future (and probably Illinois authorities later) needs to 14 be developed. We suggest that the Wgk plant arrange for a 15 meeting at which this strategy can be discussed. " Do you 16 see that? 17 A Yes. 18 Q Were you involved in coming up with strategies 19 for dealing with the federal authorities or the Illinois 20 authorities on the Pcb issues? 21 A I don't remember being involved in those 22 contacts. The custom was that contact with federal

Page 344 1 authorities were handled by people at the general office 2 and frequently contacts with state authorities would be 3 handled by people from the plant that was located in that 4 state. 5 Q Why was that the custom? 6 A The latter part of it? 7 Q Well, the reasoning behind having the people in 8 the general office contact the federal people and the 9 people at the plant contact the state people. 10 A I think it was a matter of -- as far as the 11 people at the general office, it was a matter of competence 12 that they had attorneys who could give them the proper 13 advice on how to deal with federal authorities and so 14 forth. In the case of the states, the states are generally 15 more responsive to people from that state. 16 Q Do you recall attending any meetings of the type 17 referenced here to set forth strategy for dealing with the 18 federal or state authorities? 19 A No, I don't remember that. 20 Q Let's go to Exhibit 74. Is that a copy of a 21 June 16, 1972 memorandum that was sent to you and some 22 others?	Page 346 1 Q Do you know who they were contacting in the law 2 department, was that John and -- E. V. John and Phocion 3 Park? 4 A The one I remember clearly is Phocion Park. 5 There may have been others. 6 Q Do you recall ever speaking to Phocion Park about 7 the situation? 8 A I knew him but I don't remember any specific 9 conversation. 10 Q You recall Phocion Park being involved in the 11 early ' 70s? 12 A Yes. 13 Q Let's go to Exhibit 75. Is this a copy of a 14 December 19, 1972 memorandum that was sent to you and some 15 others in connection with your employment with Monsanto? 16 A Yes. 17 Q Who was Jack Hume, H-u-m-e? 18 A Jack Hume was in production. At one time he was 19 at the Krummrich plant as an operating superintendent. 20 Later on he had some position at the general office. I 21 don't recall where he was at this particular time. 22 Q There's a statement up above that " Mr. Walter
Page 345 1 A Yes. 2 Q Under lii there, the second paragraph states 3 " written documents that will be submitted to the federal 4 authorities will have legal approval. " Do you see that? 5 A Yes. 6 Q And earlier we saw the names of E. V. John and 7 Phocion Park on some of the documents? 8 A Yes. 9 Q Do you recall the law department being brought in 10 at some point to deal with the outside entities with 11 respect to the Pcb situation? 12 A My recollection is that from the time that I 13 joined the business group in 1970 that we were regularly 14 consulting with Monsanto attorneys about the Pcb problem. 15 Q Generally what was the involvement of the law 16 department in that situation? 17 A I don't know, I didn't do it. 18 Q You say -- 19 A I was not the one making contact with the law 20 department. 21 Q Do you know who was? 22 A Mr. Papageorge, Mr. Bergen.	Page 347 1 Romanek of the federal Epa had requested testimony from 2 Monsanto on mercury losses. " Do you see that? 3 A Yes. 4 Q And it references a hearing in Collinsville, 5 where is Collinsville? 6 A Collinsville is in Illinois near East St. Louis. 7 Q Was that in connection with the Krummrich plant, 8 do you recall? 9 A Apparently so. 10 Q Do you recall the Epa requesting testimony 11 concerning mercury losses at the Krummrich plant? 12 A No. 13 Q Do you recall the Epa expressing concerns about 14 possible mercury losses from the Krummrich plant? 15 A No. I should point out that this memo is dated 16 1972 and a later part of the memo refers to Pcb's and that's 17 no doubt the reason why I received a copy. 18 Q Did you ever have any involvement addressing 19 mercury discharges from the Krummrich plant? 20 A Indirectly at a much earlier time during the time 21 that I was at the Krummrich plant between ' 63 and ' 67 I had 22 technical responsibility for the chlorine plant. One of

Page 348 1 the two cell houses was a mercury cell house and the 2 control of mercury losses was part of our program at that 3 time. 4 Q Do you recall any third parties or governmental 5 agencies expressing concern with respect to mercury losses 6 from that department? 7 A No, the motivation for our work at that time was 8 economic. Mercury is expensive. 9 Q Do you have any knowledge concerning why the Epa 10 had requested testimony in the 1972 time frame concerning 11 mercury losses? 12 A No. I had no involvement with that operation at 13 that time. 14 Q Let's go to the second page. In the second 15 paragraph, there's a statement that Mr. Pratt indicated he 16 was " not concerned about the unusual circumstances such as 17 this, but the regular discharge without extenuating 18 circumstances. " Can you let me know when you've found that 19 sentence? 20 A Yes. 21 Q Okay, recognizing that that paragraph appears to 22 talk about mercury discharges, was it your understanding	Page 350 1 any way was C. F. Moore, that's Chester Moore. He had in 2 fact worked for me when I was at the Krummrich plant in the 3 chlorine operation and I believe he was still involved in 4 the chlorine operation at this time in 1972. I suspect 5 that one of the others was a production person who was 6 involved in that but I wouldn't know which one. 7 Q Was mercury used or generated at the Krummrich 8 plant other than in the chlorine operation? 9 A Not that I know of. 10 Mr. Brock: Off the record. 11 (Recess.) 12 By Mr. Brock: 13 Q Mr. Savage, let me skip somewhat out of order and 14 ask you to turn to what I believe was marked as Exhibit 15 87. 16 (Discussion off the record.) 17 Exhibit 85, without reading through this in great 18 detail, can you identify what this is for us? 19 A Yes, this is the standard manufacturing process 20 for the Aroclors department at the Krummrich plant of 1966 21 together with a collection of amendments. 22 Q Was this the one in effect during the time that
Page 349 1 that the Epa was concerned about the same type of thing 2 with respect to Pcb discharges, meaning regular discharges 3 without extenuating circumstance? 4 A I don't know of any connection. 5 Q Well, when you say you don't know of any 6 connection, I'm interested in knowing whether or not your 7 understanding of the Epa stance at that time was similar 8 with respect to Pcb's in the sense -- 9 A No. I have no idea how the Epa might have 10 weighted unusual discharges versus more continuing 11 discharges. 12 Q The next paragraph mentions a problem in area 3, 13 do you see that? 14 A Yes. 15 Q Do you know what area 3 was? 16 A No. 17 Q If you look at the list of cc's to this 18 memorandum, who would have been involved in -- or who would 19 have had responsibility for mercury discharges from the 20 Krummrich plant at that point in time? 21 A In looking at this list, the only one I know of 22 who was involved in chlorine operations or technology in	Page 351 1 you were at the Krummrich plant? 2 A This date is during the time that I was at the 3 Krummrich plant since I was there from ' 64 through ' 67 -- 4 ' 63 through ' 67. 5 Q Let me ask you to turn to the page that ends in 6 Bates number 841 and that has a microfilm number of 2042. 7 You can see that that's the beginning of a tentative 8 amendment J, and there's a copy of it that was sent to you? 9 A That's right. 10 Q What was your involvement in amendments to the 11 standard manufacturing procedures for the Aroclor 12 department at the Krummrich plant in the 1970 time frame? 13 A At that time I was manufacturing manager, so I 14 was one of those who would approve an amendment before it 15 would be put into effect. 16 Q Did you have any involvement in approving or 17 dealing with those after you left the Krummrich plant? 18 A Yes. This was after I left the Krummrich plant, 19 this is during my time as a manufacturing manager, this 20 memo. 21 Q I'm getting my dates confused. I'm sorry. And 22 on the next page, the page that ends in Bates number 842,

Page 352 1 that's your signature at the bottom ; is that correct? 2 A Yes. 3 Q Let me ask you to turn to the page that ends in 4 Bates number 944. 5 A Okay. 6 Q And the heading on that page is " Atmospheric 7 discharge -- waste disposal. " Do you see that? 8 A Yes. 9 Q The first document I showed you I think was in 10 1957, standard manufacturing process for the production of 11 Aroclor at the Anniston plant. We talked about a category 12 like this not being in that 1957 document. Does this 13 refresh your recollection as to such a category being added 14 to the standard manufacturing processes sometime between 15 1957 and 1966? 16 A Well, obviously it had been added, but I don't 17 recall the event. 18 Q Do you have any knowledge as to what the 19 background or impetus was for adding categories like this 20 in the manufacturing procedures? 21 A Well, clearly standards were changing at that 22 time as to the importance of matters like this. It's no	Page 354 1 decision was made. 2 Q But when you say technical production manager, 3 are you referring to a department or a particular person? 4 A No. When I became a manufacturing manager in 5 1970, that I think was the first time that that title was 6 used. Before that some of the same people were in similar 7 positions and they were called technical production 8 managers at that time. 9 Q Do you know who the technical production managers 10 were in the 1960s? 11 A I think Rheiny Wobus was one. At some point Paul 12 Edwards became one. I think John Smith was one, Ron Wiese 13 was a Tpm at that time. 14 Q How do you spell his last name? 15 A W-i-e-s-e. 16 Q Any others that you recall in the 1960s? 17 A Well, Dez Hosmer had that title at one time but 18 by the time we're referring to, he was the boss of all of 19 the technical production managers and his title, I think, 20 was manager of manufacturing technology. 21 Q Anybody else? 22 A Those are the only ones that I remember.
Page 353 1 surprise that such a category would have been added during 2 the ' 60s. 3 Q Does the fact that this was added as a category 4 to the standard manufacturing procedure for Aroclor 5 indicate to you that there was some concern about 6 atmospheric discharges and methods of waste disposal for 7 Pcb's before Dr. Riseborough's study came out in the late 8 1960s? 9 A No, I don't think so because the content of a 10 standard manufacturing process was prescribed by a standard 11 procedure, a standard format. And I should think that if 12 it had been added to this one, it was probably added to all 13 others at about the same time. 14 Q Do you have any knowledge why it was added -- and 15 I have seen it in a number of others -- do you have any 16 knowledge as to why a category like that was added 17 generally to the manufacturing procedures around that time? 18 A I don't recall it being done. The content and 19 format of the standard manufacturing process was under the 20 control of technical production manager organization in 21 St. Louis and I was still at the plants during the ' 60s. 22 So as far as I know I didn't participate in whatever	Page 355 1 Q Let me ask you to turn to the page that ends in 2 Bates number 947. 3 Down towards the bottom of that page there's a 4 heading for toxicity. Do you see that? 5 A Yes. 6 Q And it states " this material is a liquid under 7 normal conditions and has a medium toxicity range for 8 liquid ingestion and high toxicity for vapor inhalation. " 9 Do you see that? 10 A Yes. 11 Q Does that indicate to you that there was some 12 awareness within Monsanto in the 1960s of effects of 13 Aroclor with regard to toxicity? 14 A I don't know. This very page is inconsistent 15 because you'll observe up above, under toxicity, item 5, it 16 says " toxicity does not present a serious problem. " I 17 don't know how to explain that contradiction. 18 Q But it also says " instructions are also issued to 19 avoid actual skin contact with biphenyl and Aroclor as much 20 as possible and to wash hands and face before eating. " Do 21 you see that? 22 A Yes. Those are normal precautions that we would

Page 356 1 recommend handling any chemical material. 2 Q Were those precautions issued -- strike that. 3 Why were those precautions normally issued with 4 respect to chemicals? 5 A I think it was just considered prudent. 6 Q Was that in recognition of the possibility that 7 the chemicals could present some sort of hazard if skin 8 contact was not avoided? 9 A No, I don't know of any recognized hazard related 10 to skin contact. 11 Q Down below where it talks about Aroclor having a 12 medium toxicity range, what does the phrase " medium 13 toxicity range " mean to you? 14 A That doesn't mean very much to me. I don't know 15 what it means. 16 Q During the 1960s do you know whether you reviewed 17 the standard manufacturing processes for the Aroclor 18 department at the Krummrich plant? 19 A I don't remember doing so. 20 Q That would not have been something that you were 21 required to do in connection with your job 22 responsibilities?	Page 358 1 the Aroclor department at the Anniston plant? 2 A Yes, I think so. We always instructed the 3 operators that they should minimize skin contact, clean up 4 if they did have skin contact. 5 Q Did you have the understanding that that type of 6 understanding within Monsanto predated your stint as 7 production supervisor of the Aroclor department at the 8 Anniston plant? 9 A Yes, I believe that we had some safety data 10 sheets on Aroclor that indicated that. I don't know how 11 old the information was but I think it did predate my time 12 as production supervisor. 13 Q Let's go back to Exhibit 76. Is this a copy of a 14 September 1973 memorandum that was sent to you and some 15 others in connection with your employment at Monsanto? 16 A Yes. 17 Q And it states " on September 7, 1973 Epa published 18 their first ' List of Toxic Pollutants. " Do you see that? 19 A Yes. 20 Q And in the second paragraph it begins with the 21 statement " Pcb's were of course on the list. " Do you see 22 that?
Page 357 1 A The writing of standard manufacturing processes 2 was the responsibility of production supervision, and I was 3 in Tsd. It would have not been unusual for production to 4 ask for assistance from me or from my engineers, but it 5 still would not have been our direct responsibility. 6 Q If you turn to the next page, which is the page 7 with the Bates ending in 948. There's a heading " other 8 hazards " and it states " this material can cause dermatitis, 9 systemic poisoning from the fumes, and yellow atrophy of 10 the liver. They are skin, mucous membranes and eye hazards 11 encountered in handling this material. " 12 Do you see that? 13 A Yes. 14 Q Did you have that understanding in the 1960s? 15 A I don't remember anything specific from that 16 period of time. 17 Q Does this indicate to you that there was some 18 recognition within Monsanto of hazards that could be 19 presented by Aroclors prior to the 1969, 1972 time frame? 20 A I think we recognized that it was somewhat toxic. 21 Q Do you know whether there was such a recognition 22 during the time that you were a production supervisor of	Page 359 1 A Yes. 2 Q Do you recall this list of toxic pollutants 3 coming out? 4 A I remember that there was such a list. I don't 5 remember the event of its coming out. 6 Q Do you know why the reference is to Pcb's of 7 course being on the list? 8 A I think Pcb's by that time had achieved some 9 notoriety and therefore we just assumed that the Epa would 10 have to deal with it. 11 Q There's a reference in the first paragraph to a 12 suit by an environmental group after which the Epa entered 13 into a consent decree to publish proposed effluent 14 standards. 15 A Yes, I see that. 16 Q Do you recall being aware of such a suit by an 17 environmental group? 18 A No. 19 Q Do you recall there being any discussions within 20 Monsanto about whether Monsanto might be sued by an 21 environmental group with respect to the Pcb situation? 22 A No, I don't remember.

Page 360 1 Q Who was V. Brawley, B-r-a-w-l-e-y, referenced at 2 the top? 3 A Virgil Brawley was the foreman in the Krummrich 4 Aroclor department. 5 Q Let's go to Exhibit 77. Is this a copy of a 6 February 14, 1974 memorandum that was sent to you and some 7 others in connection with your employment at Monsanto? 8 A Yes. 9 Q There's a reference to an Eia task force meeting, 10 do you see that up at the very top? 11 A Oh, yes, yes. 12 Q Do you recognize the name Electronic Industries 13 Association? 14 A No, but I knew that there was an organization of 15 these companies. 16 Q Did you ever have any dealings with the Eia? 17 A Not as an organization. I had some dealings with 18 some of these companies. 19 Q Did any of your dealings with those companies 20 address Pcb pollution matters? 21 A Yes. 22 Q What were the nature of your dealings with those	Page 362 1 Q And P. G. Benignus? 2 A Paul Benignus reported to Cumming Paton at that 3 time. 4 Q On page 2 entry number 5 references " inability of 5 industry to conform with the suggested low effluent limit. 6 Steps being taken for relief. Needs for all to respond to 7 Washington. " Do you see that? 8 A Yes. 9 Q Do you know what steps Monsanto was taking for 10 relief? 11 A No. 12 Q On the page that ends in Bates number 061 and the 13 third paragraph it states " I was told that when Monsanto 14 develops a super-duper non-pcb to let the committee know. " 15 A Yes. 16 Q Does that refer to a dielectric fluid? 17 A Dielectric fluid, yes. 18 Q Did Monsanto ever develop such a non-pcb 19 dielectric fluid? 20 A We developed a non-pcb dielectric fluid but it 21 apparently was not super-duper because it was not accepted. 22 Q Let's go to Exhibit 78. Is this a copy of a
Page 361 1 companies on that subject? 2 A This only occurred at some time during my time as 3 a manager. We invited the customers to come in for some 4 kind of meeting and one part of the meeting was that I made 5 a presentation on those parts of our plant pollution 6 control efforts that might be applicable to their plants 7 where they used Aroclors. Not all of these companies did 8 attend it and I don't remember which ones did attend. 9 Q Did anybody work with you on your presentation? 10 A Probably so but I don't remember. 11 Q Do you recall the substance of your presentation? 12 A Only in a very general way. We talked about 13 things like catch basins and sampling methods. Most of the 14 control efforts that we had in manufacturing process would 15 be irrelevant to the customers. 16 Q Did the subject come up of whether they or 17 Monsanto could be sued for Pcb pollution? 18 A No. My presentation was entirely about practical 19 aspects of controlling pollution. 20 Q Who was a C. Paton, P-a-t-o-n? 21 A That's Cumming Paton. He was product manager for 22 functional fluids at that time.	Page 363 1 February 26, 1974 memorandum that was sent to you and some 2 others in connection with your employment at Monsanto? 3 A Yes. 4 Q Category number 2 is disposal of Aroclor drums. 5 Do you see that? 6 A Yes. 7 Q And it says " visit Evans. " Do you see that? 8 A Yes. 9 Q Does that refresh your recollection as to who the 10 contractor may have been who's responsible for disposal of 11 Aroclor drums? 12 A The implication is that it's somebody named Evans 13 but that, I don't recollect that name. 14 Q Do you recall alternative -- alternate methods 15 being developed with respect to disposal of Aroclor drums 16 around that time? 17 A No. 18 Q Let's go to the page that ends in Bates number 19 223 under the category B, items to obtain goal 3 and the 20 reference is to " losses to river, " do you see that in the 21 middle of the page? 22 A Yes.

Page 364 1 Q Are you aware of any way that the Pcb's from the 2 plant reached the river other than through the sewers? 3 A No, I don't know of any other way. 4 Q Let's go to Exhibit 79. Is this a December -- a 5 copy of a December 9, 1974 memorandum that was sent to you 6 and some others in connection with your employment with 7 Monsanto? 8 A Yes. 9 Q Who is G. F. Fort, F-o-r-t? 10 A Garth Fort. He was a pollution specialist. He's 11 been involved in pollution control environmental matters 12 for all the time I've known him, but I don't know what his 13 position was at this time. 14 Q Was he at the Krummrich plant or was he in 15 St. Louis or strike that. Do you know where he was 16 located? 17 A No, I don't. 18 Q Do you recall there being a meeting between 19 Monsanto personnel and Niosh personnel -- 20 A No. 21 Q -- concerning Pcb matters? 22 A No.	Page 366 1 of this exhibit that I'm listed as having attended that 2 meeting and I find that kind of startling because I don't 3 remember. 4 Q Does that refresh your recollection at all as to 5 having any involvement in an epidemiological study by Niosh 6 or by any other organization? 7 A No. 8 Q Let's go to Exhibit 80. Do you see your name 9 listed in handwriting? 10 A Yes. 11 Q Do you know whose handwriting that is? 12 A That has the initials Hsb at the bottom which 13 would be Howard Bergen. 14 Q Does that indicate to you that you received a 15 copy of this in or about July of 1975? 16 A Yes. 17 Q Do you recall what you did with this information, 18 if anything? 19 A Well, this is a statement by the customer 20 organization of the Epa. I don't recall that I took any 21 action and I don't even know why Howard would have sent me 22 a copy.
Page 365 1 Q I take it you never had any contact with Niosh 2 personnel concerning that? 3 A No, not personally. 4 Q Do you recall there being a study conducted of 5 the -- of Monsanto employees with respect to the effects of 6 work place exposure to Pcb's? 7 A I remember that there was an epidemiological 8 study. I don't recall any particular result. 9 Q Do you recall when the epidemiological study was 10 conducted? 11 A No. 12 Q Do you recall who was tested? 13 A Well, it was workers in the Aroclor departments. 14 I think at both Krummrich and Anniston. 15 Q Do you recall how you learned about that study? 16 A No. 17 Q Do you know who was responsible within Monsanto 18 for handling that study? 19 A Well, we had a group under Dr. Wheeler which 20 included, I notice George Lavinskas is listed here and some 21 others, they would have orchestrated such a study because 22 they were the experts in that. I notice in the last part	Page 367 1 Q When you said customer organization, I thought 2 you said Epa. Did you mean Eia? 3 A Eia to the Epa, excuse me. 4 Q Were you ever involved in any lobbying efforts 5 with respect to Pcb standards or other Pcb matters? 6 A Not that I recall. 7 Q Does this refresh your recollection as to any 8 dealings you may have had with Eia people concerning Pcb 9 matters? 10 A No. 11 Q Let's go to Exhibit 81. Is this a copy of an 12 October 15, 1975 memorandum that was sent to you and some 13 others in connection with your employment with Monsanto? 14 A Yes. 15 Q This refers to a national symposium on Pcb's. Do 16 you see that? 17 A Yes. 18 Q And it says, states the following people 19 attended, " subject, Monsanto meeting, " and you're one of 20 the people listed? 21 A Yes. 22 Q Do you recall attending such a national symposium

Page 368 1 on Pcb's around this time frame? 2 A This memo is minutes of an internal meeting in 3 Monsanto which apparently was in preparation. You'll 4 notice the memo is dated October 15 and the symposium is 5 listed as being a month later. So this apparently referred 6 to a meeting to prepare for that later symposium. 7 Q Fair enough, you're right. Do you recall being 8 involved in the preparations for a national symposium about 9 Pcb's? 10 A No. 11 Q Who is D. R. Bishop? 12 A Dan Bishop was in Pr at that time. 13 Q What about T. L. Gossage? 14 A That's Tom Gossage, who was marketing director. 15 Q How about R. E. Keller? 16 A Bob Keller was in the applied sciences group, I 17 think, research. 18 Q Who was W. W. Withers? 19 A Wayne Withers is an attorney. 20 Q Do you know what area of law, if any, he 21 specialized in? 22 A No. He was a general attorney.	Page 370 1 A No. 2 Q Do you recall making a request of that type 3 around this time frame? 4 A I don't know about the time frame. No, I don't 5 remember doing this. 6 Q Do you recall trying to find out what the waste 7 disposal methods had been for Pcb's at the Anniston plant 8 other than to the sewer? 9 A No, I don't know of any reason connected to my 10 regular duties that would have made me need this historical 11 information. 12 Q Let's go to the end of the second page and it 13 ends with the statement, " Since I understood from our 14 telephone conversation that you would clear these data 15 through the legal department and other appropriate people, 16 I have not reviewed the data with anyone outside of the 17 Monsanto plant. " Do you see that? 18 A Yes. 19 Q Does that refresh your recollection as to any 20 reason why you would have made such a request at that time? 21 A I would have had no immediate use for the data, 22 so the only reason I would have asked for data like this is
Page 369 1 Q He was in Monsanto's law department ; correct? 2 A Yes. 3 Q Do you know why attorneys, or an attorney in 4 Monsanto's law department was involved in the preparations 5 for the symposium? 6 A No. 7 Q Who is D. Wood? 8 A That's David Wood. He was product manager 9 reporting to Cumming Paton involved in functional fluids. 10 Q Let's go to Exhibit 82. Is this a copy of a 11 November 10, 1975 memorandum sent to you in connection with 12 your employment with Monsanto? 13 A Yes. 14 Q And the first sentence reads " This memo supplies 15 the last of the data available to fulfill your request for 16 air sample analyses, water, effluent analysis and flow and 17 waste disposal other than sewer. " Do you see that? 18 A Yes. 19 Q And W. T. Tafey, he was at the Anniston plant at 20 this time, wasn't he? 21 A Yes. 22 Q Do you recall making such a request to him?	Page 371 1 that someone else had asked me for it but I don't know who 2 that would be. 3 Q Do you have an understanding as to why you would 4 have cleared the data with the legal department? 5 A No. Because we exchanged this kind of data 6 between the plant and myself routinely and I did not clear 7 it with the legal department. 8 Q Do you recall discussing with him whether or not 9 the data should be revealed to anyone outside of the 10 Anniston plant? 11 A I don't remember asking him for the data so I 12 don't remember that. 13 Q Let's skip one and let's go to Exhibit 84. Is 14 this a copy of a November 8, 1975 memorandum that was sent 15 to you and some others in connection with your employment 16 with Monsanto? 17 A Yes. 18 Q And there's an asterisk by your name? 19 A Yes. 20 Q And that indicates you were present at a 21 dielectric task force meeting? 22 A Yes. It's a Santosalt-dielectric. Santosalt was

Page 372 1 not a dielectric so apparently the meeting was about both 2 of those subjects. 3 Q What is Santosalt? 4 A Santosalt was a trade name that we used for some 5 functional fluids that were developed as Pcb replacements 6 as a solvent for use in carbonless copy paper. 7 Q Do you recall being a member of a 8 Santosalt-dielectric task force? 9 A No, but I remember working on those subjects. 10 Q Can you describe for me the work that you did on 11 those subjects? 12 A Well, these new fluids were being developed in 13 research and I worked with research to provide some 14 economic guidance on the various substitutes to help them 15 come up with the most economic products they could and then 16 after the products had been developed, then I worked out 17 plans to manufacture the new products. 18 (Savage Exhibits 86 and 87 identified.) 19 By Mr. Brock: 20 Q Let's go to Exhibit 86. Is it a copy of a July 21 10, 1972 memorandum sent to you and some others in 22 connection with your employment with Monsanto?	Page 374 1 A They were no longer marketed or used for one 2 reason or another. 3 Q Do you recall whether there was any discussion as 4 to whether or not something else should be done with them? 5 A No. 6 Q Can you read the writing, the handwriting down 7 below? 8 A I think I can make it out. This appears to be a 9 note from Paul Heisler. It says " Mike, please advise if 10 you visualize serious problems. Assume you " -- and some 11 name beginning with H -- " will set up some reasonable 12 method of handling. " 13 Q Up above, there's a name Harry Rayfield. It 14 appears in handwriting? 15 A Yes. And it looks like the name down below is 16 Harry. 17 Q Who was Harry Rayfield? 18 A I remember the name, but I don't remember what 19 his position was. 20 Q Do you recall there being any discussions around 21 that time about whether or not problems could be presented 22 by discarding solid Aroclors to the landfill?
Page 373 1 A Yes. 2 Q Who was Elmo Campbell? 3 A He was in the shipping department or the 4 warehouse department at the Krummrich plant. 5 Q Do you know whether he's still alive? 6 A No. 7 Q Do you recall having any dealings with 8 Mr. Campbell concerning Aroclors? 9 A No. 10 Q Do you recall there being an instruction around 11 the 19 -- strike that. In the early 1970s to discard to 12 the landfill solid Aroclors warehoused at the Wgk plant? 13 A No. 14 Q I take it you don't recall or know what the -- 15 strike that. 16 Do you have an understanding as to why this 17 instruction referenced in this memorandum was given? 18 A These products had become obsolete. 19 Q When you say obsolete, does that mean there was 20 no longer a market for them -- strike that. 21 When you say " obsolete, " what do you mean by 22 " obsolete "?	Page 375 1 A No, I don't remember any discussion like that. 2 Q Do you have an understanding why this memorandum 3 would have originally been sent to the names that are 4 typewritten and then additionally to the other names that 5 are referenced? 6 A Well, it appears that this originally went -- 7 this particular copy originally went to Paul Heisler 8 because there seems to be an arrow next to his name. And 9 then he sent it onto the additional four people listed at 10 the top by hand. Mike Foresman was involved in the 11 environmental area, Jim Dalton I think was a production 12 superintendent at that time, Clarey Buckley was involved in 13 environmental control. 14 Q Let's go to Exhibit 87. There's a reference -- 15 the first sentence reads " the disposal alternatives 16 discussed with Central Foundry are all environmentally 17 acceptable. " Do you see that? 18 A Yes. 19 Q Up at the top in the re: line there's a reference 20 to Pcb sludge. Do you see that? 21 A Yes. 22 Q Do you recognize the name Central Foundry?

Page 376 1 A That's a part of General Motors, one of our 2 customers. 3 Q Do you recall what disposal alternatives had been 4 discussed with them? 5 A No, I don't know. 6 Q In the third paragraph it states " if for business 7 reasons we decide that we will actively help Central 8 Foundry and offer them our plant facilities, we should 9 immediately discuss this with Jim Savage because this 10 service will be an unusual activity and require special 11 handling at the plant. " Do you see that? 12 A Yes. 13 Q Do you recall being involved in any discussions 14 of whether or not Monsanto should offer its plant 15 facilities to Central Foundry? 16 A No. 17 Q Do you know whether that was in fact done? 18 A I don't think so. Papageorge nominates me in 19 this case simply because I was the normal interface with 20 the plant. 21 Q Do you recall discussions about whether or not 22 use of the Krummrich toxic dump should be offered for	Page 378 1 By Mr. Brock: 2 Q I've marked as Exhibit 88 -- or I've marked 3 Exhibit 88, Mr. Savage. Is this a copy of an October 24, 4 1974 memorandum sent to you and some others in connection 5 with your employment with Monsanto? 6 A Yes. 7 Q It states " Pcb losses at the Sauget Village 8 outfall have been erratic since the first week in 9 October. " Do you see that? 10 A Yes. 11 Q Do you know what the reference to Sauget Village 12 outfall refers to? 13 A Sauget Village is the name of a small municipal 14 where the Krummrich plant is. This refers to the treatment 15 plant that handles waste from the Krummrich plant. The 16 outfall would be the place where the effluent from the 17 treatment plant went into the river. 18 Q Down below it makes some recommendations and the 19 first is to " discontinue sampling at the Sauget Village 20 outflow until waste treatment plant construction is 21 completed and our former sampling system is reinstituted. " 22 A Yes.
Page 377 1 customers who wanted to dispose of Pcb matters? 2 A I don't recall discussing it. 3 Q Do you recall discussions at any time concerning 4 whether Monsanto should stop using the Krummrich toxic dump 5 for its own Pcb wastes? 6 A Not before the fact. Just in recent years I have 7 had casual conversations with Jack Molloy who was the plant 8 manager at the time that the dump was closed, about that 9 decision, but it was casual conversation long after the 10 fact. 11 Q Do you recall at all what the casual 12 conversation, the substance of the casual conversation? 13 A Just that he felt that it was a good decision 14 that he had made to close it. 15 Q He told you it was his decision? 16 A Yes. 17 Q Did he say why he felt that was a good decision? 18 A No, I don't think so. 19 Q Did the subject of pollution or possible 20 pollution from the toxic dump come up? 21 A No. 22 (Savage Exhibit 88 identified.)	Page 379 1 Q The reference to " our former sampling system 2 being reinstituted, " what does that refer to? 3 A Well, if you observe the second paragraph of this 4 memo he talks about a slow speed sampler being used. We 5 had learned by this time very well that that was an 6 inadequate way of measuring, so his recommendation number 7 one is to just stop until a proper sampler can be put back 8 in place. 9 Q And recommendation number two is " discard from 10 our records all data at the Svo after 10/9/74. " Do you see 11 that? 12 A Yes. 13 Q Do you recall why the recommendation was given to 14 discard data after that date? 15 A No, but it follows very logically from item 1 16 that that data would be meaningless. 17 Q Why would the data be meaningless? 18 A Because it had been taken with an improper 19 sampling device. 20 Q Do you know whether that was in fact done, the 21 discarding of the records? 22 A No, I don't.

Page 380 1 Q Do you recognize the name Bernard C. Bosse, 2 B-o-s-s-e? It's not on that document. 3 A No, it doesn't ring any bells with me. 4 Mr. Brock: Off the record. 5 (Discussion off the record.) 6 (Savage Exhibits 89 and 90 identified.) 7 By Mr. Brock: 8 Q I have marked as Exhibits 89 and 90 or I've 9 marked those exhibits. Mr. Savage, is Exhibit 89 a copy of 10 a May 27, 1975 memorandum that was sent to you and some 11 others in connection with your employment at Monsanto? 12 A Yes. 13 Q And is Exhibit 90 a copy of a May 28, 1975 14 memorandum that you sent to Howard Bergen in connection 15 with your employment at Monsanto? 16 A Yes. 17 Q Is the writing up at the top where it says " file 18 Aroclor pollution " in both documents, is that your writing? 19 A Yes. 20 Q Referring first to Exhibit 90, what 21 responsibilities, if any, did you have with regard to a 22 decision of whether or not to temporarily dispose of Montar	Page 382 1 whether or not to use the landfills as temporary 2 expedients, why were the landfills being considered as 3 temporary expedients? 4 A One of the primary justifications for the 5 incinerator was to have a good way of destroying Montar 6 residue and we would not be pleased to do anything 7 different than that. So the fact that it was being sent to 8 a landfill would be considered temporary. 9 Q Do you recall when the consideration of the use 10 of incinerators first came up? 11 A No. It was somewhere around 1971, ' 72. It was 12 early in our considerations of the Pcb problems. 13 Q In connection with the consideration of the use 14 of incinerators for the destruction of Pcb's, are you aware 15 of any investigation that was done to determine whether 16 Aroclors had leaked or somehow migrated from the Krummrich 17 landfill? 18 A No. 19 (Savage Exhibit 91 identified.) 20 By Mr. Brock: 21 Q I've marked as Exhibit 91 Monsanto's 22 paragraph 1. a submission regarding the Krummrich site.
Page 381 1 at the Texas Ecologists landfill? 2 A I think I was simply responding to Mr. Hosmer's 3 memo, Exhibit 89, where he was asking if anybody 4 disagreed. I was just letting Howard know that I agreed. 5 Q Do you recall why you expressed agreement with 6 that? 7 A No. 8 Q As a general matter in the 1975 time frame, what 9 were the nature of your responsibilities, if any, with 10 regard to disposal of Montar or Montar residues in 11 landfills? 12 A Montar is the name we gave to still residue from 13 the Aroclor process and the normal procedure at that time 14 was to burn the residue in the incinerator. It proved to 15 be quite difficult. So it's referred to here as some 16 temporary expedient until that operation can be approved -- 17 improved. But I don't remember the specifics of this 18 incident of this particular memo. 19 Q Aside from the use of landfills for disposal of 20 Montars as a temporary expedient, do you recall any 21 discussions of whether -- strike that. 22 When you say you were involved in decisions of	Page 383 1 Mr. Savage, rather than have you read through the entire 2 document, maybe it's quicker if I could just lead you to 3 specific sections. Let me ask you to turn to the third 4 page of the exhibit and that talks about something called a 5 site G. Can you just read through the description of that 6 and let me know whether you're familiar with that area? 7 (Witness reviewed the document.) 8 If it helps you, there's a map attached to the 9 end. There's a G. 10 A Yes, I see on the map. I don't recognize that 11 area. 12 Q Okay, in the fourth paragraph under the heading 13 for site G, there's a statement that " soil sampling at this 14 site revealed high concentrations of organics, particularly 15 Pcb's. " Do you see that? 16 A Yes. 17 Q Does that refresh your recollection at all as to 18 Pcb's having been found to have migrated or leached from any 19 off-site disposal area associated with the Krummrich plant? 20 A No. I never had anything to do with any off-site 21 disposal area. 22 Q Did it ever come to your attention that Pcb's had

Page 384 1 been found to have migrated or leached from any off-site 2 disposal area associated with either the Krummrich or 3 Anniston plant? 4 A No. 5 Q What about the Newport plant, did migration or 6 leaching of Pcb's from an off-site disposal area come to 7 your attention in connection with the Newport plant? 8 A No. 9 (Recess.) 10 (Savage Exhibits 92 and 93 identified.) 11 By Mr. Brock: 12 Q I've marked Exhibits 92 and 93 for the record. 13 Mr. Savage, is Exhibit 92 a copy of a November 6, 1975 14 memorandum to you concerning Pcb disposal data? 15 A Yes. 16 Q Could I ask you also to pull out what had been 17 marked as Exhibit 82 previously. 18 A Okay. 19 Q Exhibit 92 starts off with the sentence " Jim, per 20 our telephone conversation this morning you will find 21 attached copies of all of the plant liquid effluent 22 analytical data which we still have in our files for the	Page 386 1 production at Anniston. 2 Q When you were production supervisor at the 3 Anniston plant, what was the impetus for you being provided 4 with information concerning discharges of Pcb's to Snow 5 Creek? 6 A I don't remember that I had any data while I was 7 production supervisor. 8 Q And again, what would have been the route by 9 which the Aroclors from the Anniston Aroclor department 10 reached Snow Creek? 11 A It would have been through the plant sewers and 12 then through the limestone bed in the front yard, a 13 discharge to the limestone bed went into Snow's Creek which 14 was across the highway, as I recall. 15 Q Number 2 refers to data on fish samples taken by 16 Gunning and Sutkus. Do you see that? 17 A Yes. 18 Q Do you recall requesting or receiving data on 19 fish samples in connection with the Anniston plant? 20 A No, I was familiar with the existence of such 21 data but I don't recall asking for it. 22 Q Who were Gunning and Sutkas?
Page 385 1 period 1/1/71 through 6/30/75. " Do you see that? 2 A Yes. 3 Q When we were talking about Exhibit 82 which is 4 dated four days later, I think you stated you didn't recall 5 making such a request. Does looking at Exhibit 92 refresh 6 your recollection about making a request to Mr. Tafey to 7 generate Pcb disposal data with respect to the Anniston 8 plant? 9 A This appears to be responsive to the same request 10 but I don't remember making it. 11 Q There's a reference to effluent to Snow's Creek, 12 is reported through October of 1972? 13 A Yes. 14 Q Do you see that? 15 A Yes. 16 Q Do you recall being supplied at any time with 17 information concerning the discharge of Pcb's from the 18 Anniston plant to Snow Creek? 19 A I think that at the time Anniston was producing 20 Pcb's and I was manufacturing manager, that they gave me 21 that kind of data on a routine basis. This memo being 22 dated in 1975 was considerably after we had stopped	Page 387 1 A They're consultants. 2 Q Did you ever deal with them? 3 A No. 4 Q Did those refer to individuals? 5 A Yes, I think those are two people who are -- who 6 were partners in some kind of a consulting firm. 7 Q Do you know what the consulting firm was, what 8 the name of it was? 9 A I think that was the name of it, Gunning and 10 Sutkas. 11 Q There's handwriting at the bottom that appears to 12 me to say " Jim, disposal to landfill follows. " Do you see 13 that? 14 A Yes. 15 Q Do you recognize that handwriting? 16 A I don't exactly recognize the handwriting but 17 that little symbol on the end I think is a stylized T. And 18 I think that's a way that Bill Tafey may have signed an 19 informal comment like this. 20 Q Do you know what that refers to, " disposal to 21 landfill follows "? 22 A I think it refers to the memo of November 10

Page 388 1 where he gives me data on disposal to the landfill. 2 Q Fair enough. 3 Do you recall asking for or being supplied with 4 any sediment analysis or water analyses? 5 A No. 6 Q Referring to Exhibit 93, that appears to be a 7 memorandum dated December 5, 1975 from Tafey to Art Leisy 8 at the Krummrich plant regarding Pcb/epa? 9 A Yes. 10 Q Do you recall there being interactions between 11 Tafey and Art Leisy at the Krummrich plant regarding 12 Pcb's -- regarding Pcb's around this time frame? 13 A I don't know about the time frame but bill and 14 art knew each other and I'm not surprised that they had 15 such an interaction. 16 Q Down below -- what are chlorinated terphenyls? 17 A We made two different lines of Aroclor. One was 18 chlorinated biphenyl and usually was sold with a four-digit 19 number beginning at 12, such as 1242 and so forth. We had 20 another line of Aroclors which were not -- which were 21 chlorinated terphenyl. And those were generally sold with 22 numbers beginning with 54 such as 5460. So they were made	Page 390 1 Q Do you recall there being an investigation into 2 the disposal of chlorinated terphenyls to the landfill 3 associated with the Anniston plant? 4 A I don't remember any specific investigation. 5 Q Let's go to the second page of the exhibit where 6 it states " none of the information has been reviewed by 7 legal or business group. " Did you have the understanding 8 around this time frame, meaning 1975, that Monsanto's legal 9 department was looking into the questions of whether and 10 how much Monsanto -- whether Monsanto had disposed of Pcb's 11 or chlorinated terphenyls to landfills and how much? 12 A No, I don't know why Bill made that comment. 13 Q And business group, what does that refer to? 14 A Business group referred to Howard Bergen and his 15 staff, which included me. 16 Q In Exhibit 92 up in the top right-hand corner 17 there's some handwriting where it says " Fepa, " is that your 18 handwriting? 19 A I don't think so. 20 (Savage Exhibits 94 and 95 identified.) 21 By Mr. Brock: 22 Q I've marked Exhibits 94 and 95 for the record.
Page 389 1 in some of the same equipment and made in a similar way but 2 they were chemically different. 3 Q Had the concerns that had been raised with 4 respect to -- strike that. 5 Had the environmental concerns that had been 6 raised with respect to polychlorinated biphenyls also been 7 raised with respect to chlorinated terphenyls? 8 A Not in the same way. As far as I know 9 chlorinated terphenyls were never found in the environment, 10 meaning in fish samples and such. 11 Q Did you have an understanding one way or the 12 other about whether chlorinated terphenyls would behave 13 differently in the environment? 14 A Chlorinated terphenyls were generally solids, 15 whereas chlorinated biphenyls were generally liquids. 16 That's not an absolute distinction because a highly 17 chlorinated biphenyl could be a solid and a low chlorinated 18 terphenyl could be a liquid. But in general, that was the 19 distinction and since the chlorinated terphenyls were 20 generally solids, it was -- there didn't seem to be any 21 reasonable way that that material would wind up in an 22 aquatic environment.	Page 391 1 Mr. Savage, I'd like you to take a moment just to 2 glance through Exhibit 94. And if it speeds your review, 3 your name is referenced on the page that ends in Bates 4 number 682. Once you've had a chance to do that, can you 5 identify what this is for us. 6 A It's an emergency plan by John Zeman and several 7 other people written in early 1976. It appears to be a 8 contingency plan for the possible event of a ban on Pcb's. 9 Q If you look on page -- the page that ends in 10 Bates number 682, the category for the letter G is " defined 11 detailed decontamination procedure for use at Krummrich 12 and " other -- " and possible adaptation for customers. " And 13 it says " responsibility, J. R. Savage. " Do you see that? 14 A Yes. 15 Q Let's take a look at Exhibit 95. Is that your 16 outline in response to being assigned that responsibility? 17 A Yes. 18 Q Do you recall how you came to be assigned the 19 task of defining decontamination procedures for use at the 20 Krummrich plant? 21 A Not exactly. Sometime in late 1975 the specialty 22 products group was merged with another business group, John

Page 392 1 Zeman was a part of that other business group. There were 2 two manufacturing managers, Bob Pohl and me and one of us 3 was redundant and that turned out to be me. By 1976 I did 4 not have a permanent assignment so I assume this was some 5 kind of temporary assignment. 6 Q Do you recall coming up with this decontamination 7 plan? 8 A Now that I see it, I recall having worked on 9 something like this, yes. I had forgotten about it. 10 Q Do you recall what you did to come up with the 11 decontamination plan? 12 A I would have developed this information by 13 consulting with the plants where we had already taken 14 certain Pcb equipment out of service and therefore would 15 have had to go through a procedure like this. 16 Q Under the third entry under category B in Exhibit 17 95 where it says " drums to be disposed of and approved 18 landfill. " Do you see that? 19 A Yes. 20 Q Do you know why that was recommended? And I'm 21 thinking in light of your earlier statements that 22 incineration was being investigated at around this time.	Page 394 1 Q The purpose of the incinerator at the Krummrich 2 plant, the Aroclor incinerator was to deal with liquid 3 wastes from the Aroclor operations ; correct? 4 A Yes, but that conflicts a little bit with what I 5 just said. We did dispose of the Montar from the Krummrich 6 operation in that incinerator by keeping it very hot and 7 mixing it with some liquid waste. By that time we were 8 getting some return material from customers which we could 9 mix with the Montar to make it a little easier to handle. 10 Q Before the incinerator was constructed at the 11 Krummrich plant, had the liquid wastes that were 12 subsequently handled in the incinerator, had those been 13 sent to the landfill, to your knowledge? 14 A Well, I don't recall that we had liquid waste. 15 This sounds a bit confused. The Montar could be handled as 16 a liquid by keeping it very hot. But when it was hauled to 17 a landfill, it was hauled in solid state. I really never 18 witnessed what became of the material when it was taken. 19 Presumably it went to the landfill. 20 (Savage Exhibits 96 and 97 identified.) 21 Mr. Brock: For the record I've marked as 22 exhibits, Exhibits 96 and 97. Both are dated August 1,
Page 393 1 A Well, if you'll refer to item 2 just above 2 " solids to be placed in drums along with used gloves, 3 rags " and so forth, I think the third item, " drums to be 4 disposed of in approved landfill " refers to the drum in 5 that item 2 containing solids. The incinerator that we had 6 built at Krummrich plant was only designed for liquid feed 7 and therefore could not take this kind of material. 8 Q By this time had Monsanto -- strike that. 9 Around this time frame was Monsanto disposing of 10 liquid Aroclor wastes in any landfills that you know about 11 associated with the Krummrich or Anniston plant? 12 A I don't know. 13 Q In the early -- in the late ' 60s and early ' 70s 14 do you know whether Monsanto was disposing of liquid 15 wastes -- liquid Aroclor wastes at the Krummrich or 16 Anniston landfills? I'm taking the question back to the 17 earlier time frame. 18 A Not that I know of. Montar still residue was 19 drawn from the stills as a liquid but it had a very high 20 melting point so it would be a solid at the time that it 21 was disposed of. That's the only waste from the Aroclor 22 department that I can recall having gone to the landfill.	Page 395 1 1972. 2 By Mr. Brock: 3 Q Referring first to Exhibit 96, Mr. Savage, is 4 this a memorandum from E. E. Stewart to yourself along with 5 some others with an attachment that was sent to you or 6 directed to you during the course of your employment with 7 Monsanto? 8 A Yes. 9 Q Is that your writing up in the top right-hand 10 corner? 11 A Yeah, that appears to be my writing. 12 Q There's a paragraph that reads " the attached memo 13 was prepared as a document that could be passed to the 14 federal authorities in the event we were asked ' what have 15 you done at Wgk in the past to control Pcb entrances into 16 the environment. '" Do you see that? 17 A Yes. 18 Q And then down below it makes a reference to 19 having the " document (in hand)" to give to the federal 20 authorities in the event that Monsanto was asked for such a 21 document. Do you see that? 22 A Yes.

Page 396 1 Q Do you recall what the impetus was for coming up 2 with a prepared statement to give to the federal 3 authorities in that event? 4 A No, I don't know of any reason to expect -- for 5 the plant to have expected to be asked for that. 6 Q And again this makes reference to things that had 7 been done in the past at the Wgk plant. Does this refresh 8 your recollection as to whether or not there was any 9 concern that the Epa was going to be focusing on discharges 10 that had gone on in the past at the Wgk plant? 11 A Well, it appears that the time span of this 12 attachment begins in 1969 and covers events from then 13 through the date of the memo, so I, as far as I can 14 interpret this, it was a fairly recent series of events 15 that they were summarizing. 16 Q I would agree with that. In fact on the page 17 that ends in Bates number 202 it starts with the sentence 18 " during the past three years, varied actions have been 19 implemented at the W. G. Krummrich manufacturing facilities 20 to restrict and reduce Pcb entrance into the environment. " 21 Do you see that? 22 A Yes.	Page 398 1 them? 2 A As far as I know, no. 3 Q Let's go to Exhibit 97. Is this a copy of an 4 August 1, 1972 memorandum from E. E. Stewart to you in the 5 course of your employment with Monsanto? 6 A Yes. 7 Q Who is G. A. Hippe, H-i-p-p-e, if I pronounce his 8 name correctly? 9 A Yes, that's correct, Gail Hippe. 10 Q What was his position? 11 A I think he was a production superintendent at the 12 plant at that time. I don't know why he's got a copy of 13 this. 14 Q Can I turn you to the page that ends in Bates 15 number 669. Stewart mentions that he had prepared a 16 " chronological history of actions taken at Wgk to reduce 17 Pcb entrances into the environment. " Do you see that? 18 It's up at the very top of the page. 19 A Yes. 20 Q Do you recall having any role in the preparation 21 of that chronological history of actions? 22 A No, I don't recall.
Page 397 1 Q Do you know how it was chosen to go back three 2 years? 3 A No, I don't. 4 Q On the page that ends in Bates number 203, 5 there's a reference to an educational program being 6 " directed to the operating personnel related to good 7 housekeeping and the need for care to control and contain 8 Aroclor wastes in the manufacturing areas. " Do you see 9 that? 10 A Yes. 11 Q Do you know what that educational program 12 consisted of? 13 A No. 14 Q Do you recall there being additional educational 15 efforts along those lines being made around this time 16 frame? 17 A No, that would have been done at the plant and I 18 would not necessarily be involved in that. 19 Q Do you know whether this information was in fact 20 ever requested by the federal or state authorities? 21 A Not that I know of. 22 Q So to your knowledge it was never provided to	Page 399 1 Q Do you recall what, if anything, you did with the 2 information that was provided to you? 3 A No. 4 (Savage Exhibit 98 identified.) 5 By Mr. Brock: 6 Q Mr. Savage, is Exhibit 98 an August 6, 1970 7 memorandum that was sent to you and some others in the 8 course of your employment? 9 A Yes. 10 Q Who was Milton Beaudine? 11 A Milt Beaudine was at the Krummrich plant at that 12 time. I don't know what his responsibility was. 13 Q In the second indented paragraph under -- in the 14 number one section there's a statement " returned drummed 15 material from customers is being collected on the south lot 16 to be held until the incineration unit is on line. " Do you 17 see that? 18 A Yes. 19 Q Do you know what that reference to the south lot 20 refers to? 21 A No, it's just some empty space in the plant. 22 Mr. Brock: Off the record.

Page 400 1 (Discussion off the record.) 2 By Mr. Brock: 3 Q Mr. Savage, let me ask you to take a look back at 4 Exhibit 91. The second page of that, number 2 discusses 5 something called " south lot drumsite. " Do you see that? 6 A Yes. 7 Q Looking at that do you believe that the reference 8 to the south lot drumsite in Exhibit 91 is the same south 9 lot? 10 A It seems likely. 11 Q From your time at the Krummrich plant or from 12 your subsequent responsibilities, were you familiar with 13 the operations or activities in that south lot area? 14 A No. 15 Q Were you familiar with the fact that it was used 16 for a storage of drums? 17 A Yes, I knew there was such a place but I would 18 have no reason to be concerned about it. 19 Q Why was that? 20 A Well, drum storage was handled by the 21 shipping/warehouse department and not by any department 22 that I had any responsibility for.	Page 402 1 torrential rains as one possible reason for an upward trend 2 in the Pcb losses for the month of August, 1972. Would you 3 interpret this the same way? 4 A Yes it's a speculation apparently. 5 Q I called it a postulation. Are you aware of any 6 discussions along the lines of whether rains -- whether 7 discharges from the plant -- from the sewers meaning 8 discharges from the sewers rather than to the sewers had 9 increased as a result of heavy rains? That was one effect 10 of the rains? Let me rephrase. 11 Mr. Burnett: Yes. It's kind of confusing. 12 Mr. Brock: I agree with that. 13 By Mr. Brock: 14 Q Do you recall there being any discussions about 15 whether heavier than normal rains had been attributed to or 16 correlated with or the cause of any discharges of Aroclors 17 or Pcb's from the sewers, meaning in terms of leakage or 18 that type of thing? 19 Mr. Burnett: I object to the form of the 20 question. I think it's vague and confusing, but you can 21 answer if you can. 22 The Witness: I don't think I can answer it.
Page 401 1 (Savage Exhibit 99 identified.) 2 By Mr. Brock: 3 Q Mr. Savage, is Exhibit 99 a copy of a September 4 1, 1972 memorandum sent to you or directed to you from E. E. 5 Stewart in the course of your responsibilities with 6 Monsanto? 7 A Yes. 8 Q Let me ask you to turn to the second page of the 9 exhibit. The end of the first paragraph on that page 10 contains a sentence which reads " torrential rains may have 11 resulted in groundwater flows to sewers and sewer system 12 purging actions. " Do you see that? 13 A Yes. 14 Q What are sewer system purging actions? 15 A That's not a term that would normally be used 16 about sewers. It seems to imply that the unusual flow from 17 the groundwater -- from the rain resulted in flows 18 sufficient to flush out anything that was present in the 19 sewer that might otherwise have accumulated there. 20 Q Do you know whether the concern had ever been 21 expressed -- strike that. 22 As I interpret this, this is postulating the	Page 403 1 This is just a hypothesis and I don't recall having 2 discussed that as a specific reason for losses going up or 3 down. 4 By Mr. Brock: 5 Q Do you know whether that hypothesis was ever 6 checked out? 7 A No. 8 Mr. Brock: All right. Now is probably a good 9 time to stop. 10 (Whereupon, at 5: 50 p. m. , the deposition was 11 adjourned, to reconvene at 9: 30 a. m. , on Thursday, May 20, 12 1993.) 13 _____ 14 James R. Savage

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