CAUSE NO. 06-H-0395-C

AUBREY CLARK AND WIFE, KELLY CLARK : IN THE DISTRICT COURT
: OF MATAGORDA COUNTY,
: TEXAS
vs. :
: 23rd JUDICIAL DISTRICT
KELLOGG BROWN & ROOT, LLC :
AND HALLIBURTON COMPANY : MAY 7, 2007

VIDEOTAPED DEPOSITION OF: KENNETH MUNDT, PH.D.

APPEARANCES:

FOR THE PLAINTIFFS:

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. . . . Deposition of KENNETH MUNDT, PH.D., a witness, taken on behalf of the Plaintiffs, AUBREY CLARK AND WIFE, KELLY CLARK, in the herein before entitled action, pursuant to Texas Rules of Civil Procedure, before Jill E. Remillard, duly qualified Notary Public in and for the State of Connecticut and Commonwealth of Massachusetts, held at Sheraton Bradley Hotel, 1 Bradley International Airport, Windsor Locks, Connecticut 06096, commencing at 10:08 a.m. on MONDAY, MAY 7, 2007.

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S T I P U L A T I O N S

It is hereby stipulated and agreed by and among counsel for the respective parties that this deposition is being taken pursuant to the Texas Rules of Civil Procedure.

It is further stipulated and agreed that the

witness will read and sign the deposition transcript.

It is further stipulated and agreed that an unsigned copy of the transcript will be used at the time of trial.

*****

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1 ---

I N D E X

2 ---

WITNESS: KENNETH A. MUNDT, PH.D. PAGE

3 ---

4 DIRECT EXAMINATION BY MR. BROWN..... 5

5

---

6 E X H I B I T S

---

7 NO. DESCRIPTION PAGE

8

Plaintiff's

9

1 Letter, 5/3/07, with attachments..... 4

10

2 K. Mundt Report, 5/4/07..... 4

11

3 C. Williams affidavit..... 4

12

4 G. McGinnis affidavit..... 4

13

5 P.F. Infante article re latency..... 4

14

6 R.A. Rinsky article re epidemiologic risk .. 4
15 assessment

16 7 R.A. Rinsky article re benzene exposure and 4
hematopoietic mortality

17

8 OSHA Occupational Exposure to Benzene; 4
18 Final Rule

19 9 L. Zhang article re chromosomal aberrations. 4

20 10 API Toxicological Review..... 4

21 11 Benzene data sheet..... 4

22 12 Folder of documents..... 4

23 13 Notebook re Clark case..... 20

24 14 Study of German rubber workers..... 51

25 15 Brown & Root document, 6/1/63.....185

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(Plaintiff's Deposition Exhibit Nos. 1 through 12 offered and marked.)

THE VIDEOGRAPHER: Good morning. We are going on the record. The time is 10:08 a.m. Today's date is May 7th, 2007. We are located at the Sheraton Bradley Airport Hotel, One Bradley International Airport, Windsor Locks, Connecticut.

This is a videotape deposition of Dr. Kenneth Mundt, taken on behalf of the plaintiff.

The case name is Aubrey Clark and wife, Kelly Clark, Plaintiff, versus Kellogg Brown & Root, LLC, and Halliburton Company, Defendant, venued in District Court of Matagorda County, Texas, 23rd Judicial District, cause number 06-H-0395-C.

My name is Rocco Leone, legal video specialist, representing Niziankiewicz & Miller

Court Reporting, 972 Tolland Street, East Hartford, Connecticut, with Jill Remillard, certified court reporter.

Counsel, please state your name, your office, and who you represent in this action.

MR. BROWN: Darren Brown, Provost Umphrey,

representing the plaintiffs.

MR. MARTINGANO: James Martingano, Mehaffy Weber, representing the defendants.

THE VIDEOGRAPHER: You may now swear in the witness.

(The witness was duly sworn.)

MR. BROWN: James, as far as agreements, we're taking this pursuant to Texas Rules of Civil Procedure. Is that agreed?

MR. MARTINGANO: That's right. And we also have a standing agreement on these depositions, Darren, regarding signature. The witness will read and sign, but we've agreed to use an unsigned copy at the time of trial since trial is coming up on the 14th.

MR. BROWN: All right.

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KENNETH A. MUNDT, PH.D., the Deponent, having been first duly sworn, deposes and says as follows:

DIRECT EXAMINATION BY MR. BROWN

Q. Good morning, sir. Would you state your full name, please?

A. Kenneth Arthur Mundt.

Q. What's your home address, sir?

A. 260 Lincoln Avenue, Amherst, A-m-h-e-r-s-t,

Massachusetts.

Q. Where is a daytime phone where you can be reached?

A. (413) 256-3556.

Q. Where does that ring?

A. That's my office.

Q. And who are you employed by?

A. I'm employed by ENVIRON International Corporation.

Q. What's your job there?

A. I'm a partner in the firm, and I direct the epidemiology practice area.

Q. Anything outside the area of epidemiology that you direct or oversee?

A. I oversee the IHSP, industrial health and safety practice. I oversee the nanotechnology practice.

Q. How long have you been with ENVIRON International Corp.?

A. Since November 2003.

Q. What's your occupation, sir?

A. I'm trained and practice as an epidemiologist.

Q. And you've been hired by Brown & Root, through its lawyers, the Mehaffy Weber law firm, to

act as an expert witness in the area of epidemiology in this case; is that correct?

A. Yes, sir.

Q. My name is Darren Brown. You and I have never met before, have we, sir?

A. That's correct.

Q. I represent Mr. Clark and his family in their lawsuit against Brown & Root, leading to his acute myelogenous leukemia. And you realize that in that capacity, I'm on the opposite side of the lawsuit from the company who hired you to be an expert witness?

A. I understand that.

Q. Have you ever given your deposition before?

A. Yes, I have.

Q. How many times?

A. Roughly 12 or 15.

Q. I notice that you testified in a case called Ringstaff, in March of 2006, and then also at trial

during that same month. How many times have you given deposition since then?

A. I'd have to refer to my list, which is part of my file.

Q. We've marked your folder as Exhibit 12.

A. (Examining documents.) I gave a deposition

on June 6th.

Q. What type of case was that?

A. This was a trace benzene case, California.

Q. What was the disease?

A. I believe it was a CML, chronic myelogenous leukemia.

Q. And you're looking at your list. Do you have the name of that case on your list?

A. I do. Rick Coulter and Nancy Coulter v. Parks Corporation.

Q. What list is that that you're looking at?

A. This is a list of testimony from the previous five years.

Q. Is it complete, accurate, and up-to-date?

A. Yes, sir, it is.

Q. And who prepared the list of testimony in the last five years?

A. This is maintained by my staff and updated as needed.

Q. Okay. So it would have all the testimony you've given up until today's date; is that correct?

A. Within the last five years.

Q. Okay. I mean, for instance, have you testified within the last month in a benzene or toxic case, as an epidemiologist, and it not appear on that

list there?

A. No, sir. It's up-to-date.

Q. Okay. Have you testified in an AML case?

A. No, I have not.

Q. Have you ever testified in a myelodysplastic syndrome case?

A. No, I have not.

Q. How many times have you testified at trial?

A. Two or three times.

Q. In addition to the Ringstaff trial, where you testified last March, in 2006, what other cases have you testified in?

A. I testified briefly at trial as a fact witness. I believe that was last year, in the Lattin case, May 6th.

Q. All right. Was that an accident that you had observed personally?

A. No, sir. I was called to testify about a study I had published.

Q. Okay. As an epidemiologist?

A. As an epidemiologist, but not as an expert epidemiologist.

Q. All right. Who called you to testify at that trial?

A. I don't recall the lawyer's name. Tim -- I

won't guess, but from the firm of Thompson Hine.

Q. A defense firm?

A. Yes.

Q. All right. Other than that trial testimony, have you -- and the Ringstaff trial, have you testified in any other trials?

A. I recall one trial ten years ago, my first. It was a dioxin case in Rhode Island.

Q. So you've testified on three times: once in a dioxin case; once in a benzene case, as an expert witness, which was the Ringstaff case; and then another time as a witness on epidemiology?

A. As a fact witness, testifying about the facts of the study I had published.

Q. Was there a disease that was at issue in that case where you testified as a fact witness on epidemiology?

A. Yes, sir.

Q. What was that disease?

A. Brain cancer.

Q. What type of brain cancer? Do you remember?

A. I don't recall.

Q. And that completely summarizes your trial testimony; is that correct?

A. I believe so, yes.

Q. Have you ever given any sworn testimony before any governmental agency, such as OSHA or the EPA?

A. No, sir.

Q. Any governmental agency at all?

A. I'm sorry. Sworn testimony?

Q. Yes.

A. Before any governmental agency? No, sir.

Q. Having given depositions in the past, you know what it is we're doing here; correct?

A. Assuming it will be similar to the previous ones, yes.

Q. Well, we're putting everything on videotape. It's being typed up by a court reporter, and your deposition will be put into a transcript, which you're familiar with; correct?

A. Yes, sir.

Q. And it can be used at the trial of this case, just as though you were in front of a judge and

jury, testifying in person. Do you realize that?

A. Yes.

Q. Do you realize that you're under oath to tell the truth today in your deposition, just as though you were in front of a judge and jury?

A. Yes, sir.

Q. And that failure to tell the truth can result in you being put in jail?

A. Yes, sir.

Q. During the deposition, if I ask a question that you don't understand, would you stop me and not answer my question and tell me that you don't understand it?

A. I'll be happy to.

Q. All right. If you answer my question, may I and the jury assume you've understood what I've asked you?

A. Fair enough.

Q. What did you do to prepare for today's deposition?

A. I prepared a report last week, based on the content of the epidemiological literature that I reviewed, as well as the documents provided to me by defense counsel, supplied on the three CDs that are part of my folder.

Q. All right. We've marked your folder of documents as Exhibit 12; is that correct?

A. Yes.

Q. Can you identify Exhibit 12 for the jury, please?

A. Yes. It's a folder containing the following

items: The notice for deposition. A cover memo accompanying the notice of deposition. A copy of my CV. The list of testimony provided in the past five years. The report itself. An index to the materials that I received in this case, from defense counsel.

Q. And that's the index of all the materials that are on the three disks that are attached to that folder?

A. That's my understanding, yes.

Q. Well, have you read it and compared it to make sure that it is accurate and complete?

A. No. This is maintained by my staff, as materials arrive. I have reviewed these materials, and I assume it's an accurate representation of what's on these.

Q. All right. You've reviewed the materials that are on the disk; is that correct?

A. Yes, sir.

Q. You've reviewed all of the materials that

are on the disk; is that right?

A. At least to screen or scan them. There's certain large volumes of materials, especially medical records, that I didn't review every page of.

Q. All right. For the medical record, you're stating you didn't review every page. Are there any

other documents that are on those disks, that you didn't review or read in preparation for your deposition?

A. Yes. There are several copies of Brown & Root safety manuals that are largely redundant, year after year, and large sections that did not pertain to any potential use of solvents or relevant materials to this case.

Q. All right. Sometimes I need to object to responsiveness. I need to do that now. You can ignore my objections.

What my question was is, can you tell us, from your remember -- or your memory, from knowing what's on those disks, any that you did not review in preparation for your deposition or your report?

A. Well, if I understand how you've rephrased the question, then I've reviewed them all. I did not review all sections of all documents, is my previous response.

Q. Okay. And with regard to the ones where you haven't reviewed all sections, can you give us a list of those?

A. Yes: The medical records and the Brown & Root safety manuals.

Q. Anything else that you didn't review in

their entirety, out of those disks?

A. (Examining documents.) Likewise, there are several redundant documents pertaining to schedule of rates for offshore construction, Brown & Root documents, the Halliburton annual report, several other technical manuals that were not directly relevant, or redundant with other materials that I've screened.

Q. Would it be fair to say that you have reviewed all of them and considered all of them, whether or not you have used -- and used the ones you felt were significant in preparation of the report that you -- we've got a copy of in Exhibit 12; is that right?

A. Yes, sir.

Q. The CV that you have in Exhibit 12, is it accurate and up-to-date?

A. Yes, it is.

Q. Is it truthful?

A. Yes, sir.

Q. In other words, the things that you say that you've done in your CV, you've actually done?

A. Absolutely.

Q. Okay. I show you what we've marked as Exhibit 1 to your deposition. You have a copy of it

in there. I'll let you verify that that's a copy of the same notice of deposition that you received.

A. (Examining document.)

Q. And that's in the file we've marked as Exhibit 12.

A. It appears to be the same.

Q. I think we've got an additional cover letter on there --

A. Yeah.

Q. -- but other than that, they -- are they the same to you?

A. There are some -- there's a -- there are two documents on top of what I received. (Indicating.)

Q. Okay. You received the last two pages or three pages of what we've marked as Exhibit 1; is that right?

A. I received a document three pages, beginning "cause number 06" and so forth.

MR. BROWN: All right.

MR. MARTINGANO: I don't think we sent him the certificate of discovery.

MR. BROWN: Okay.

Q. (BY MR. BROWN) Let me just say, so that we are... Out of Exhibit 1, we've got seven pages, and what you're telling me is you received four, five,

and six; is that correct?

A. That's correct.

Q. Okay. Did you have a chance to go and look --

A. I'm sorry. You said out of seven pages, four, five, and six? I thought it was the last three pages of --

Q. Well, my last page, the seventh page is the fax sheet. Did you receive that?

A. Oh, is that -- yes. That's correct. I did not receive that.

Q. Okay. So you received four, five, and six of Exhibit 1?

A. Correct.

Q. And did you have a chance to look through the items 1 through 14 that we asked to be brought to your deposition today?

A. Yes, I did.

Q. And have you brought all documents that are

responsive to items 1 through 14?

MR. MARTINGANO: Objection to form.

THE WITNESS: I did not bring -- I was not able to address all items. I brought what was available.

Q. (BY MR. BROWN) All right. Look on request

1. Did you bring all documents you have with response to item number 1 in the subpoena?

A. Yes, with the exception of the memo I mentioned earlier, accompanying the first two CDs received from Mr. Martingano.

Q. What memo was that?

A. It's referenced in the index. This is simply a cover memo --

MR. MARTINGANO: I think it's just a cover letter.

THE WITNESS: -- saying, "Here's some CDs." It's this memo, received on April 9th by our office, accompanying these CDs.

Q. (BY MR. BROWN) April 9th of 2007?

A. Correct.

Q. Any particular reason why you didn't bring that memo?

A. I couldn't find it.

Q. Oh, okay.

A. Everything I've dealt with is electronic.

It was paper, and it has been separated from this somehow.

Q. All right. Looking through the rest of the list, can you just go down it and tell us whether you've brought all of your documents responsive to

each of those requests, or if not, which documents that you know you have, that are not here?

A. Yes. Number 2, I have.

Number 3, I believe I have, with this exception noted.

I did not bring any billing records. In fact, this matter hasn't been invoiced yet. I see the first material received were on March 31st, so perhaps there was no time charged until April 1st, the month of April. Invoicing from our office in Arlington, Virginia, is probably in the works. They usually receive the invoices to sign off by the middle of the month following the month for which the time was recorded. So they don't exist yet. The records exist in the billing system, but I don't have immediate access to that.

I brought something not quite responsive to number 6, because I've never given expert testimony on industrial hygiene, state-of-the-art and so on. I

assume that may have been a typographical error. But I did give you all testimony that I have given in the last five years, a list that had been prepared for a case previously testified to this year.

The studies are here in this notebook, number 7.

There are also some other background information. There's some pages from American Cancer Society website. There's also a list of materials that are contained in this binder.

Q. All right.

A. I have --

Q. That notebook that you have there, what do you call that notebook?

A. I call it the notebook.

Q. The notebook on the Clark case?

A. It's the -- it's a -- this is a notebook of articles relevant to the matter in the Clark case, in which -- which I reviewed and used to formulate my opinions in this case.

Q. Okay. Let's -- do you mind if I put an exhibit sticker on that, as Exhibit 13?

(Plaintiff's Deposition Exhibit No. 13 offered and marked.)

Q. (BY MR. BROWN) All right. Are there any

other epidemiological studies or health studies that you used in formulation of your opinions or preparation of your report, that are not included in Exhibit 13?

MR. MARTINGANO: Objection to form.

THE WITNESS: In order to arrive at this

set, there was a large -- literature searched and screened. These are the ones that I believe are most relevant to the question of AML and benzene exposure. So I don't note the ones that were set aside or that didn't reach appropriate level of epidemiological quality to be included and relied upon.

Q. (BY MR. BROWN) Well, all right. Let me object to response.

My question is, is very simply, have you included within your notebook, Exhibit 13, all the opinions which you think are pertinent to the formulation -- strike that.

Have you included within your notebook, 13, all of the studies, epidemiological studies and health studies that you believe are pertinent in the formation of your opinions or the preparation of your report in this case?

MR. MARTINGANO: Objection to form. And

Darren, just -- so, I don't want there to be an argument about this, but we have had sort of a prior agreement, Keith and I, about the studies that the epidemiologists have relied upon. And we made an agreement that you didn't have to bring every study you've ever looked at. It was

just the ones that were specifically reviewed in this case. I think that's what this binder qualifies for, because there's really no way -- he's got some indexes to the report, but there's no way he can bring every single study he's ever looked at. So that's why your question is a little broad.

MR. BROWN: I'm not asking that, James. I appreciate that. And I don't mean -- if you all have got agreements.

Q. (BY MR. BROWN) But what I'm trying to find out is, which ones have you relied upon? And I would think that if you're going to prepare a notebook that thick of cases that you felt were pertinent, you would have included all the ones that you've relied upon in forming your opinions; is that correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: That's correct. I think you had two questions.

Q. (BY MR. BROWN) All right.

A. I think the answer is the same to both. These are the materials upon which I relied.

Q. All right. There may be other studies out there that you reviewed, but for one reason or another, you didn't feel that those were something

that you needed to rely upon or were such that they were reliable enough for you to rely upon; is that fair?

A. Correct.

Q. Okay. Is there anything that comes to mind, in terms of an epidemiological study or health study, that you know that's out there, that you have relied upon, that's not in Exhibit 13?

A. Yes, sir.

Q. Which study is that?

A. I'm aware of the series of studies or reports by Aksoy, the Turkish shoe manufacturers, that are not, technically not epidemiological studies.

Q. All right. Are they not in Exhibit 13?

A. They are not in here, correct.

Q. And you relied upon those in preparation of your opinions in this report?

A. I have reviewed them and determined that

though there is some informational value, but they don't meet the standard of quality for an epidemiological study.

Q. All right. So you haven't included those in Exhibit 13 because you don't feel like they meet the -- your standards of what a study needs to be

before you could rely upon it?

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) Is that right?

A. That's mostly correct. I also understand that others have relied on those materials, and therefore, they're available in the case, and that I may comment on those things.

Q. Well, with regard to the Aksoy study, who do you have an understanding has relied upon those?

A. I believe that Dr. Infante has commented on those.

Q. All right. Anyone else?

A. Not off the top of my head.

Q. And you said that they did contain some information of value. What information of value in the Aksoy study did you glean?

A. Aksoy's reports and other case reports and case series are of some informational value. They generate hypotheses, but they're not epidemiological

studies that can test hypotheses. So there's a limited value to those kinds of materials. So I don't --

Q. They do have value, but -- excuse me. I'm sorry. It's your testimony that they do have value, although limited?

A. Correct. The limited value is often in raising a question that can be answered with a more scientific method.

Q. All right. With regard to Exhibit Number 12, have you reviewed and relied upon each of those documents that are contained in that exhibit, in formation of your opinions, in preparation of your report?

A. I'm sorry. I believe you're referring to Exhibit 13?

Q. No. I was talking about Exhibit 12. Now, we -- I thought we covered 13. We may have already covered 12, but I wanted to make sure that we had.

MR. MARTINGANO: Are you asking if he's relied upon the stuff in his file?

MR. BROWN: Yes.

THE WITNESS: Okay. Well, there's certain items, obviously, I didn't rely upon to formulate my opinion, including the notice of deposition,

the correspondence, the index of the materials, my CV, my previous testimony. I have relied upon the materials that I reviewed and summarized in my report.

Q. (BY MR. BROWN) Okay.

A. As well as the information contained on the

CDs.

Q. When were you first hired in this case?

A. It must have been the last days of March. The first materials I received in this case were March -- dated March 31st.

Q. Do you usually have a contract with whoever it is that you agree to work for as an epidemiologist?

A. I believe there's always a contract. You're talking about a written contract?

Q. Yes, sir.

A. No.

Q. Is it your practice never to have a written contract?

A. It's not my practice never to have a written contract. It's usual not to have a written contact -- contract.

Q. It's your usual practice that there is no written agreement between you and the -- either the

law firm or the company who hires you to testify as an epidemiologist in a case; is that correct?

A. It's probably more often without a written contract and more often with an oral contract.

Q. All right. What makes the difference, in terms of whether you have a written contract or

whether it's an oral contract to work for somebody as an epidemiologist?

A. It doesn't make a difference to me, as the scientist. I imagine the -- my business office would have a different opinion.

Q. All right. And what makes the difference, in terms of your business office, whether they would require a contract or not?

A. I think, as a matter of business practice, it's prudent to have a written contract, although that judgment is left to me, as a partner in the firm.

Q. All right. And that's what I'm asking you: What makes the determination in your mind as to whether you need a written contract or not?

A. I typically don't require a written contract until I have some problem with a client, such as lack of payment or --

Q. Okay.

A. -- breach of what I understood the terms to be.

Q. Do you have or do people who you work for in the past or have -- you've been approached by, do they have authority to list you as an expert before they contact you?

A. I'm not sure I understand --

Q. Well, you have --

A. -- what you mean by authority.

(Discussion off the record.)

THE WITNESS: I'm not sure what Mr. Brown means by the phrase authority.

Q. (BY MR. BROWN) Let me rephrase. For persons who have used you in the past as an expert or consulted with you in the past as an expert, do those law firms have your permission to list your name as an expert in a case they're working on without contacting you and letting you know that you're going to be listed as an expert?

A. I wouldn't know who might list me. I expect that if someone intends to list me, that they give me a call and that I say, "You may list me."

Q. That's what you require; is that correct?

A. I would say that's a standard of practice. I can't say that I have a policy that -- I would

expect that, yes.

Q. Do you know of it ever having occurred that somebody listed you without having first contacted you and letting you know that?

A. I'm not aware of that, no.

Q. When you were contacted in the last part of

March in this case, who contacted you?

A. Mr. Martingano.

Q. And what were you asked to do?

A. I was asked to review facts and materials in discovery in this case and to then do my independent epidemiological research on those aspects relevant to my expertise and to be prepared to render an opinion on those, on those materials.

Q. Is that what you recall the extent of what you were asked to do?

A. I believe so, yes.

Q. You were not asked to do any original epidemiological research in this case; correct?

A. That is correct.

Q. You were only asked to review the existing epidemiological data that's out there?

A. Correct, and the materials provided in the case.

Q. How much are you charging for your time,

acting as an expert in this case?

A. (Examining document.) I believe, currently, my time is billed in such matters at 290 per hour and testimony at 350 per hour.

Q. And has that been your standard rate for the last year?

A. No. I looked on this list of testimony and fees to verify that, because they changed the beginning of this year. They had not changed since the beginning of 2005.

Q. All right. So you -- 290 an hour for research and preparation, and 350 an hour for testimony and depositions and trial; is that correct?

A. That's correct.

Q. How many hours have you spent in preparation for your deposition today?

A. If you are referring to all of the time I've spent on this case as preparation, I really don't know. I can't really guess. In the month's time, perhaps 20 to 30 hours.

Q. Your best estimate, you spent, within the last month, 20 to 30 hours researching and preparing for this case; is that correct?

A. Correct.

Q. So your bill is in the neighborhood of

$10,000 for that work; is that right?

A. If that's the math, that's -- I don't dispute it.

Q. All right. Did you meet with Brown & Root's lawyers prior to your deposition today?

A. No, sir.

Q. Did you meet with them yesterday?

A. No, sir. Mr. Martingano and I met about 15 minutes before the deposition began.

Q. All right. Had -- with -- prior to your deposition here today, did you meet with Mr. Martingano to prepare for your deposition?

A. I'm sorry. Is that different from the previous question?

Q. Yes, sir. I mean, you told me you've met 15 minutes prior to today --

A. For the first time.

Q. -- for the first time, in preparation for your deposition; is that correct?

MR. MARTINGANO: I think what he means to say is this is the first time that we've met. We haven't had any meetings prior to that.

Q. (BY MR. BROWN) Well, that's what I'm asking you.

A. I'm sorry. I thought I answered it. No.

We had never met prior to 9:45 this morning.

Q. All right. Had you --

A. For any reason.

Q. Okay. Had you met with anybody from Brown & Root or from Mr. Martingano's law office in preparation for your deposition today?

A. No, sir.

Q. So with regard to lawyer preparation time for your deposition today, you've had 15 minutes of preparation time; is that a fair statement?

MR. MARTINGANO: Objection to form.

THE WITNESS: I might even question calling the friendly exchanges we had preparation for deposition.

Q. (BY MR. BROWN) All right. How many times have you testified as an expert witness for Mr. Martingano's firm or M.C. Carrington?

A. I have not.

Q. How many times have you been hired as an expert witness, either as a consultant or as a testifying expert, by their firm?

A. I was retained by the firm, as a consultant, once prior.

Q. And what case was that?

A. I believe it was not a case-specific

situation. It was a scientific background. I prepared a review of the literature for -- based on a review of the literature on silica exposure and lung cancer.

Q. When did you do that work?

A. Several years ago.

Q. You realize that silica is a lung carcinogen; correct?

A. Yes.

Q. Did you review any videotape prior to your deposition?

A. No, sir.

Q. Okay.

MR. MARTINGANO: Darren, just so it's fair, he's worked with us -- remember the Tucker case? Just for clarification, you did do a report in that case. I don't want there to be any --

MR. BROWN: All right.

THE WITNESS: I apologize I didn't recall that.

Q. (BY MR. BROWN) What was the type of case?

A. I would have to look at my notes to recall that.

Q. All right.

MR. MARTINGANO: It was with your office.

MR. BROWN: Okay.

Q. (BY MR. BROWN) Your work as an expert epidemiologist is typically on behalf of defendants in lawsuits; correct?

A. Could you repeat that?

Q. Your work as an expert epidemiologist,

involved in litigation, is typically on behalf of defendants in lawsuits; correct?

A. That's correct.

Q. Defendants being corporate defendants or company defendants; correct?

A. Yes, sir.

Q. Have you ever testified as an epidemiologist or an expert witness on behalf of an injured or ill plaintiff?

A. I have not testified on behalf of a plaintiff, no.

Q. Have you ever been consulted or hired to act as an expert witness for a plaintiff in any personal injury lawsuit or lawsuit alleging a disease caused by a toxic exposure?

A. Yes, I have.

Q. Who has hired you for that?

A. There were two occasions. One was my own attorney, before I joined even ENVIRON, Martin

Greenblatt. The second one, I don't recall the law firm.

Q. All right.

A. The matter pertained to an exposure sustained in a confined space.

Q. Let's talk about when you were hired as an

epidemiologist on behalf of Martin Greenblatt, your own personal attorney. What situation was that?

A. The situation was an ophthalmologist who had contracted a form of leukemia -- I don't recall a specific type -- and was concerned that her use and handling of optical dyes might have been a contributing factor.

Q. And did you provide an opinion in that case as to whether her leukemia was associated with her alleged exposures to dyes or whatever the substance was?

A. I researched the available health -- relevant epidemiological literature on the substance contained in the dyes and had to report that there was no epidemiological study one way or the other, no evidence whatsoever on the health effects of that material. And --

Q. All right.

A. Which ended my involvement in the case.

Q. Do you have a copy of that report, still?

A. I doubt it.

Q. All right. And with regard to the second situation, where you can't recall the name of the attorney, what was the alleged disease and alleged causal agent?

A. The disease was a hypersensitivity reaction in response to toluene diisocyanate exposure, resulting from the coating of fuel cells inside large aircraft. The plaintiff was an electrician, required to wire the plane after the fuel cells had been coated with this material. It's a urethane coating that off-gases the diisocyanate, and it appeared that it had not been properly ventilated. The man quickly developed a hypersensitivity and some serious health effects due to that exposure.

Q. And did you provide opinion as to whether or not his hypersensitivity was related to his exposure?

A. Yes, I did.

Q. And what was your opinion?

A. That there was strong evidence of a causal relationship.

Q. Do you remember the name of the plaintiff?

A. I do not.

Q. Is that lawsuit listed in your list of

cases?

A. No, sir. I provided no testimony in that case.

Q. Did you provide a report or affidavit?

A. I don't recall.

Q. Do you -- if you --

A. I --

Q. Excuse me.

A. -- presume not, because it's not on the list. I think I rendered an opinion that contributed to negotiations. I believe the case was settled.

Q. And you don't remember the name of the plaintiff attorney who hired you?

A. I'm sorry. I do not.

Q. Do you remember the name of the defendant that allegedly caused this illness?

A. I do not.

Q. But when it comes to testimony, every time you've testified, either in a deposition or in a trial, it's been on behalf of a defendant corporation who has been sued by a plaintiff alleging a toxic exposure to their products or to some agent on their premises; is that correct?

A. I believe that's largely correct. I had test -- I had -- have worked in many cases of

different nature. But I believe those that resulted in a deposition or court testimony have fit those criteria.

Q. All right. Just so that the record is clear, to the best of your knowledge, when you have provided testimony in a deposition or a trial where a

plaintiff is alleging a toxic exposure caused a disease, it has always been on behalf of a defendant corporation who has been sued, and they've hired you to represent them as an epidemiologist; is that right?

A. Correct, those that have gone to deposition or testimony.

Q. And in those situations where you've testified in a deposition or in a trial on behalf of the defendant corporation sued for an alleged toxic injury, you have always testified that the plaintiff's disease was not caused by such alleged exposure; is that correct?

A. That's certainly -- that's certainly the typical situation. I'm just trying to think if there are exceptions, since your question was very specific. I believe that's correct.

Q. All right. Just another way of asking it: Can you think of any instances where you have

testified as an expert epidemiologist, in a trial or in a deposition, where you have testified that the plaintiff's injury, the alleged toxic injury was, in fact, caused by exposures that were created by your -- the client who hired you?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm sorry. The reason I had stumbled the last couple of questions, I now have grasped what I was bothering about with the line of questioning, was, I think you were assuming that all of the testimony I provided was in toxic tort cases.

Q. (BY MR. BROWN) Okay. Let me get the -- in any toxic tort case where you've been asked to testify as an epidemiologist, where the plaintiff was claiming an injury due to some toxic agent, can you think of one instance where you have testified and agreed that the plaintiff's injury was, in fact, causally related to that toxic agent?

A. I believe not.

Q. All right. Who were some of your corporate clients? And let's start out by listing the ones who were corporate clients who have hired you as an epidemiologist in the field of petrochemicals.

A. I'm sorry. Are you referring to companies

that have hired me for expert services --

Q. As an expert.

A. -- testimony, expert witness?

Q. As an expert witness or -- and maybe we can go it that route first: As an expert witness, what companies have hired you?

A. As an expert witness and where testimony has been given, that information is public, and I'm happy to share it with you. Those companies have included several of the petroleum companies. Shell, for example, or Marathon or Crowne. They've included chemical companies.

Q. DuPont?

A. I don't recall DuPont. Dow, certainly.

Q. Union Carbide?

A. I don't recall a Union Carbide.

Q. How about Exxon?

A. I believe so.

Q. Mobil?

A. I believe, in the last year or two that I've become involved in benzene-related cases, there have been a number of petroleum company defendants or codefendants, not all of which I can recall, represent. I've worked on cases on behalf of the tobacco companies.

Q. Phillips Morris?

A. Phillip Morris.

Q. R.J. Reynolds?

A. Reynolds, Lorillard. None of those -- well, some of those are not tort cases.

Q. Have you worked as an expert in litigation,

as an epidemiologist, for Texaco?

A. Not that I recall, but --

Q. Chevron?

A. -- it's possible. I'm sorry. In some of these cases there are 50 or a hundred codefendants, and I really don't want to represent that I never worked on cases where they were part of a defense, nor do I know exactly where the bills are ultimately paid for my services.

Q. Well, I mean, is it your testimony that you could have been working for Texaco or Chevron and not really known it?

A. At the time, I would have known it. I'm saying I can't represent the hundreds of possible companies off the top of my head right now. I was not asked to prepare that information, so -- I'm not trying to hide anything.

MR. MARTINGANO: And to be fair, I think he's usually retained by the lawyers who

represent those defendants, and sometimes they're in defense groups, and he may not be aware of those groups.

THE WITNESS: I'm sorry. I want to correct that. Every time I'm retained, I ask for a list of all of the plaintiffs and defendants, because

I'm required, within my company, to float a conflict check. So at the point in time, I might attach a document with 200 companies, at which time I could represent exactly what clients or codefendants might be involved in the case. But I can't represent that now.

Q. (BY MR. BROWN) Your company would have records of who it is that you've represented in the past; correct?

A. Absolutely.

Q. Okay. And those records would be up-to-date? They don't throw those away or destroy them; correct?

A. I think there's no reason to retain records once matters are settled, so --

Q. Well, what about for conflict purposes?

A. For conflict purposes, you could imagine that there may not exist a conflict today, but tomorrow, one -- a company that has been in conflict

could call us. So it's not over all time period.

We really, as a global company, with thousands of clients, manage the conflicts on a realtime basis. And certainly, if somebody engages with a company that was opposing one of our clients at some point in time, we would then verify that that

no longer poses a conflict, before engaging in that work.

Q. In addition to the petrochemical industries that we have talked about for litigation, have these same companies hired you to do work for them outside of litigation?

A. I don't believe they've hired me or my office directly. Certainly, they've hired ENVIRON many, many times, for all kinds of reasons, including -- mainly having to do with environmental contamination, cleanup, audits, due diligence, and so forth.

Q. What trade associations have hired you as an epidemiologist?

A. I've done quite a lot of work for the American Chemistry Council. I've done work for the Industrial Health Foundation. I've done work for The Chlorine Institute. I'm working now for EUROSIL. It's the European Silica Producers Trade Association.

Q. Any others?

A. I'm working for two trade associations right now, but the work hasn't been completed or published, so their identity, I won't disclose.

Q. Have you done work for the Chromium Coalition?

A. I don't believe so. The chromium work that I have done was through the Industrial Health Foundation. There may have been some relationship between Industrial Health Foundation and another group, but I don't recall working directly for Chromium Coalition.

Q. Do you have any licenses or certifications, professional?

A. No.

Q. You're an epidemiologist, and what you've been asked and hired to do in this case is to testify about issues on epidemiology; correct?

A. Yes. Sorry.

Q. That's okay. I'm getting a little bit dry myself. I guess this is my glass from earlier.

You're not a medical doctor, are you, sir?

A. That's correct.

Q. You have no license to practice medicine?

A. Correct.

Q. You've never diagnosed a person with a disease?

A. Correct.

Q. That would be against the law; correct?

A. I believe so.

Q. You never had to look into the eyes of a

patient or his family and tell them that you were sorry that they had cancer; correct?

A. I've never had to? No.

Q. I'm correct about that?

A. Correct.

Q. You're not a toxicologist, are you, sir?

A. No, sir.

Q. You don't hold yourself out to be a toxicologist; correct?

A. That's correct.

Q. Never designed a toxicology study; correct?

A. Correct.

Q. And you're not an industrial hygienist; correct?

A. That's correct.

Q. Never designed an industrial hygiene program or study; is that right?

A. I've participated in the design of many industrial hygiene programs, but I'm not an

industrial hygienist.

Q. Well, as a -- in the -- when you say you participated in the design of an industrial hygiene program, they -- on those programs, did they have an industrial hygienist doing the industrial hygiene function or design of the study?

A. Yes. Absolutely.

Q. All right. And those were the people who were looked to in the particular studies or design of those studies to provide the industrial hygiene expertise, correct, not you?

A. I'm not sure what you mean by the industrial hygiene expertise.

Q. Do you consider yourself to be an expert industrial hygienist?

A. No.

Q. Okay. You won't be providing opinions in this case, to the jury, as an expert on industrial hygiene; is that --

A. Correct.

Q. Okay. You've never evaluated any industrial hygiene program?

A. I have.

Q. You have?

A. Yes.

Q. When have you evaluated an industrial hygiene program?

A. Industrial hygiene, that's why I'm trying to clarify what you mean by industrial hygiene. I understand that industrial hygienists practice industrial hygiene, but the interface between

industrial hygiene and epidemiology is quite intimate.

Industrial hygienists, in my opinion, measure, monitor, control the work environment, but they also generate information that I'm critically dependent on to do epidemiology.

Epidemiologists rest between clinical practitioners, who do the diagnosing, and the industrial hygienists that generate the exposure data. And the epidemiologists link those two. The science of epidemiology is to bring the exposure characterization to the disease end points and understand the intricacies of those relationships.

So, if a company is interested in having an industrial hygiene program that more than meets their obligations, under OSHA, to monitor and control the environment, but they also want to generate data for research purposes and to be able to characterize individual exposures in the future -- if health

questions arise, let's say, with an emerging technology -- then industrial hygienists are very interested in knowing how that information can be collected, how the program can be designed in order to meet those needs as well.

So I'm not saying that I influence the way

that the industrial hygiene program is designed to meet the legal requirements of the program, but rather, how it can meet the broad interests of a company interested in understanding health and -- of its employees.

Q. Okay. Let me object to responsiveness.

Do you have to be somewhere at two o'clock today? Do we have to -- I mean, is there a time period where we have to stop this deposition because of your purposes or your schedule?

A. Well, I have a very limited schedule. I have just returned from several days' commitment travel, business commitment, and have some obligations due tomorrow, so one way or the other, I will --

Q. I will try to do my best, but what I'm saying is if -- you know, and I know sometimes you need to -- feel the need to explain, but if we can just listen to my question, try to be as concise as

you possibly can without -- I'm not telling you how to answer. I'm just saying that might facilitate us getting through quicker.

If -- back to my question on industrial hygiene: If a company were to want to evaluate whether or not they had an adequate or inadequate

industrial hygiene program, under the law, so that they could protect their employees, they wouldn't be calling you, would they?

A. Correct.

Q. Okay. You're not a certified safety professional, are you, sir?

A. Correct.

Q. Are you a professional engineer?

A. No.

Q. Are you an environmental engineer?

A. No.

Q. Do you have any legal or law -- training as a lawyer?

A. No.

Q. Do you consider yourself to be an OSHA compliance expert?

A. No.

Q. How about an EPA compliance expert?

A. No.

Q. Do you consider yourself to be a cytogeneticist?

A. No.

Q. You know what that is; correct?

A. Yes.

Q. That's a -- what is your understanding of

that health profession?

A. It's a form of biology, understanding how -- genetic expression and interactions of the environment.

Q. All right. And you won't be providing opinions on cytology or cytogenics in this lawsuit; is that correct?

A. That's correct.

Q. You're not an expert in FISH; correct?

A. FISH?

Q. Do you have -- do you know what that is, in terms of --

A. Apparently not.

Q. -- chromosomal analysis?

A. No.

Q. Okay. Have you consulted with any cytogeneticist with regard to this case at all?

A. No.

Q. Are you a nosologist?

A. No.

Q. Have you ever published, in the peer-reviewed scientific literature, any publication pertaining to benzene?

A. I don't believe so.

Q. Now, you've been asked that question before,

and you mentioned your studies of the German rubber workers. Do you recall that?

A. Yes.

Q. In those studies, you found, in the German rubber worker, excess leukemias; correct?

A. It's possible. I haven't looked at those recently.

Q. You don't remember the results of your own study?

A. That's perhaps ten years ago. I don't -- no, I don't. I do a lot of studies.

Q. Let's see if I've got a copy. I know I've got a copy of it here somewhere. Give me a sec.

(Plaintiff's Deposition Exhibit No. 14 offered and marked.)

Q. (BY MR. BROWN) Let me show you what's marked Exhibit 14 and ask if you can identify that as your study of the German rubber workers.

A. Yes, it is. That's correct. It's one of

the publications from the German rubber study, rubber workers, German rubber workers study.

Q. And you can see where I've highlighted in the -- on the first page, the excess of leukemias there; correct?

A. In the abstract?

Q. Yes.

A. Yes. You've highlighted a phrase pertaining to leukemia.

Q. All right. Who funded that study?

A. (Examining document.) The study was funded by the German Federal Ministry of Research and Technology.

Q. And who was the primary author on it?

A. Dr. Kurt Straif, S-t-r-a-i-f.

Q. And in that study you found workers who were engaged in certain occupations or certain work areas of these facilities had excess leukemias; correct?

A. That's correct.

Q. What work areas?

A. (Examining document.) The abstract says work areas I and II. Sorry. That's not helpful. Work area I is preparation of materials, and work area II is technical rubber goods.

Q. Can you read the highlight --

A. Which is not necessarily a work area, but that's how it's characterized.

Q. Can you read the highlighted section there, on that page?

A. Yes. "Mortality from leukemia: Roughly twofold increases of mortality from leukemia were

found among workers employed at least one year in work areas I, 11 deaths, SMR 219, 95 percent confidence interval 109 to 392; and II, 14 deaths, SMR 189, 95 percent confidence interval, 103 to 317, table 8."

Q. The first is statistically significant doubling of the risk; correct? The first category?

A. The first SMR is over -- greater than 2.

Q. Right. That's telling you, as an epidemiologist, that something in these people's work environment is causing their excess leukemia, and it's not due to chance; correct?

A. That's close to correct; not exactly. It indicates that there were 2.19 times as many observed leukemias than expected for a group of this size, depending on whatever reference rate was used in that analysis. It cannot, on face value, tell you what caused that excess. It's a first step.

Q. I'm not asking you, Does it say -- Does it

tell you what caused it? I'm saying there's something in these people's work environment, that based on that information, you would think, as an epidemiologist, something there is causing this, and it's not due to chance; correct?

A. That's a possibility. That's not -- that's

not an accurate interpretation of an SMR. An SMR can only tell you whether there is an excess above what was expected. It can't tell you what the reason was for it.

Q. Well, I mean, does the 95 percent confidence interval rule out the possibilities that the excess is due to chance?

A. It doesn't -- certainly doesn't rule out, but according to the arbitrary standard that we accept, that 5 percent of the time we're wrong, it's unlikely that you observe an excess of this size simply due to chance.

Q. Okay. May I see Exhibit 14, please? Over here, on page 331 of it, it says, "Mortality from leukemia: In 1982 the IARC working group concluded that there was sufficient evidence of excess mortality from leukemia among workers employed in the rubber industry."

The very next sentence says, "Among a

British cohort, an excess of myeloid leukemia was associated with one tire plant where plastic film manufacturing entailed exposure to benzene." Did I read that correctly?

A. (Examining document.) Yes.

Q. Do you recall your prior testimony, wherein

you were asked, had you ever done any studies that involved or relate to benzene? And your answer was yes, and you referred to this study?

A. This certainly relates broadly to benzene. This is not a benzene study.

Q. All right. That's a study of rubber workers?

A. Right.

Q. You were trying to find out for this -- purposes of this study, whether there were excess disease states among this work population; correct?

A. That's correct. Your earlier question asked if I had done any benzene studies.

Q. And with regard to -- what you found out is, yes, this particular group had excess leukemias; is that right?

A. There were subsets within the rubber industry for which we detected excess occurrence of leukemias.

Q. All right. Did you, as an epidemiologist, attempt to -- or form any opinions as to the cause of the excess leukemias?

A. One would not do that, based on this level of study. This group, after I just stopped working with them, may have continued to look more

specifically at specific risk factors in the workplace. I believe at this stage of a study, one generates these kinds of observations and hypotheses, that are then tested with some more stringent types of investigations.

Q. Let me object to responsiveness.

My question was simply, did you try to form any conclusions as to the cause of the excess leukemias in that study?

A. That would be written in here. I'd have to review the text. I don't believe so.

Q. I'll represent to you I don't see it anywhere in the text. Do you recall, as you sit here, any such conclusion or opinions being rendered by you or any of the authors?

A. I think we tried to represent accurately those things in the report. It would be inappropriate to guess without appropriate analysis, detailed analysis of what's going on in these places.

Q. There's one other part I'd like to read to you from that same page we were just discussing. It says, "Our data suggest an association between mortality from leukemia and occupational exposure in work areas I and II, where exposure to solvents may have been high." Did I read that correctly?

A. It sounds correct. I agree with that.

Q. And am I fair in interpreting that as, whoever is doing this study is of the opinion that it's more than likely the solvents that is causing this excess?

A. I don't think it says that. I think it says that that's a possibility.

Q. All right.

A. This would be --

Q. Well, they don't --

A. -- at least scientifically, what's different from areas I and II, from other areas, but maybe that -- because this industry is a solvent intensive industry, that there is some role for that. It's a -- remains a hypothesis and a reasonable one.

Q. That's the only hypothesis that is mentioned there; correct?

A. That's correct.

Q. And from that, since that's the only one

mentioned, as far as the authors of this study and what they were considering, is that the possibility was that it was exposure to the solvents that was resulting in the leukemia; correct?

A. Absolutely. Untested, but a reasonable hypothesis.

Q. And one of the solvents that was in that industry was benzene; correct?

A. I believe that's correct, yes.

Q. Do you know any solvent that is more leukemogenic than benzene?

A. That's not an epidemiological question. There are studies of rubber workers in which the associations with leukemia are as great or greater for toluene, for example, the U.S. rubber worker study.

Q. Sir, let me ask you, as an epidemiologist, is your opinion that toluene causes leukemia at the same rates as benzene?

A. I don't think I've seen epidemiological study to demonstrate that.

Q. Would it be your opinion, as an epidemiologist, that with regard to solvents that can cause or have been associated with leukemia, that benzene is most strongly associated with that, among

all solvents?

A. I believe that's fair, and I think you're referring to AML, not all leukemias.

Q. Well, I mean, we can break it down into cell types if you want, but as far as solvents go, do you know of any, as you sit here, that are more strongly

associated with causing leukemia or AML than benzene?

A. I think the strongest is with benzene.

Q. All right. With regard to your study, did you break down the cell types of the leukemias?

A. I don't believe so. Keep in mind, this is a mortality study. And these are fairly small numbers. I think I read 11 and 14. So further division of that small number often gives you highly unstable numbers, that are not particularly easy to interpret.

Q. Okay. But sometimes it just --

A. I can check --

Q. -- as raw data, those are indicated somewhere. Do you recall that -- having ever separately listed the cell types of the different leukemias there?

A. That may not have been reliably available from the cause of death information. Sometimes the death certificate is only -- only indicates leukemia, and then it precludes our subdividing those.

Q. Okay. Thank you.

Sir, have you ever testified that benzene was a cause of a plaintiff's alleged leukemia?

A. No, sir.

Q. Have you ever provided any report or consulting opinion where there was a plaintiff in a

lawsuit claiming leukemia as a result of exposure to benzene, where you agreed or opined that the exposure was related?

A. No.

Q. Are you a member of the API yourself, sir?

A. No.

Q. Have you ever participated or sat on any of their committees?

A. No.

Q. Are you a member of the American Chemistry Council?

A. No.

Q. Have you ever sat on any of their committees?

A. No.

Q. Are you a member of the National Safety Council --

A. Excuse me. With respect to the ACC, I've served -- I've been retained and served as a

consultant, and I've served on more academic panels, but I haven't served on any of their official panels.

Q. How many times have you been retained by the ACC as a consultant, or the CMA?

A. My work began with the organization when it was known as CMA, and was specifically to conduct an

update of the large cohort of vinyl chloride workers. So there's a series of agreements under which I've prepared scientific research for them.

I have served as a consultant on panels where certain issues were discussed.

Q. What issues?

A. The establishment of good practices for epidemiologic research, to parallel good laboratory practices, EPA, establishing standards for workplace surveillance, occupational health and safety and exposure surveillance programs.

And one more recently -- I can't recall -- pertaining to a metaanalysis approach used by Dr. Lesley Rushton, from Birmingham University.

Q. On what disease or what agent?

A. I'm sorry. I just can't recall that. I'd have to look. It might --

Q. Was it benzene?

A. It might -- I don't think it was benzene.

It might be on my resume.

Q. All right.

A. Would you like me to look and see if I can quickly find it. I --

Q. If you can quickly find it.

(Discussion off the record.)

A. (Examining documents.) Okay. I don't see any reference here. I'm sorry.

Q. (BY MR. BROWN) But is it possible you could have worked as a consultant to the American Chemistry Council or the CMA on an issue regarding benzene?

A. I don't recall any work with them on benzene.

Q. How about leukemia?

A. No.

Q. Sir, in your practice as an epidemiologist, do you rely upon any epidemiological texts that you find to be authoritative?

A. Yes. I have a favorite.

Q. Which is it?

A. It's Ken Rothman's Modern Epidemiology.

Q. What others do you find to be authoritative?

A. Can you clarify what you mean by authoritative?

Q. What others do you use and rely upon in your

practice as an epidemiologist?

A. I use Harvey Checkoway's Occupational Epidemiology textbook. And then I use a number of others, just as references.

Q. Can you list those?

A. Some of them statistical. Text by Lemeshow,

Hosmer, on regression. Kleinbaum and Cooper. Sorry.

Q. Maybe you could spell them for her.

A. Lemeshow, L-e-m-e-s-h-o-w. Kleinbaum, K-l-e-i-n-b-a-u -- b-a-u-m. Those are probably the main texts.

Q. Have you ever done any consulting work for OSHA?

A. I have not. ENVIRON does quite a lot of work for OSHA.

Q. All right. But -- well, let me object to the response.

My question was, have you ever done any consulting work for OSHA? And I think your answer is no; is that correct?

A. Me personally. I just want to make it clear.

Q. You personally; correct?

A. I personally have not.

Q. Okay. And has any of your work as an

epidemiologist been used by OSHA for anything that your employ -- well, let me ask you this: Do you know if any of your work as an epidemiologist has ever been used by OSHA, as a consultant?

A. If my work as a consultant, for some -- any client has been used by OSHA, for what purpose?

Q. Well, let me go back. With regard -- do you -- is it your testimony is that your employer has done consulting work for OSHA?

A. Yes.

Q. In what areas?

A. We provide risk assessments for OSHA.

Q. And what -- for what chemicals or substances?

A. I don't do this work, so I don't know for sure. I know one recently was for hexavalent chromium.

Q. All right. The work that's been done for OSHA, by your employer, is not -- you have not been involved in; is that right?

A. I have not done the risk assessment. I'm not a risk assessor, so I have not participated in the work that they have done for OSHA.

Q. Have you participated in the work that your employer has done for OSHA, in any respect?

A. I don't believe so.

Q. Have you ever done any consulting work for NIOSH?

A. I've worked with NIOSH. I'm not aware that they hire consultants.

Q. Well, have -- can you answer my question:

Have you ever done any consulting work as an consulting epidemiologist for NIOSH?

A. I'm not sure exactly what you mean. I don't want to argue, but it seems like a vague question. I, two weeks ago, worked with NIOSH, and they paid my expenses for the work to cohost a workshop on nanotechnology.

Q. All right.

A. Is that consulting for NIOSH?

Q. Well, do you consider it to be?

A. I'm a consultant, and my time was donated, but my expenses were paid, so there was a relationship and there was an agreement.

Q. Other than nanotechnology that you've described, have you done any other work for NIOSH?

A. I have received a grant from NIOSH to do my doctoral dissertation work.

Q. On what -- in what area?

A. It was in sensitization and marine proteins,

seafood proteins, in the workplace.

Q. Like, if somebody's allergic to shrimp?

A. Yes, exactly, and it makes it difficult to work in a shrimp plant.

Q. Okay. With regard to NIOSH, have you ever done any consulting work on the issue of benzene or

leukemias?

A. No.

Q. Have you ever done any consulting work for the National Institute of Health?

A. Generally? I received grant money from National Cancer Institute, which is part of NIH.

Q. Well, my only question is, have you consulted -- have they hired you to do a specific study as an epidemiologist or do research for them?

A. Again, I don't understand the specifics of the relationship that you're getting at. I was awarded a grant to do a specific piece of work having to do with PAH, polycyclic aromatic hydrocarbon, exposure in the steel industry in Eastern Slovakia.

Q. By the National Cancer Institute?

A. Yes.

Q. Anything other than that study?

A. No.

Q. Was that original research work that you

did?

A. Yes.

Q. Who did you do that work with? Was that by yourself, or did you have coauthors?

A. Let's see. That was done while I was still part of a different company, Applied Epidemiology,

and that was done with a colleague who -- in Germany, who now works for ENVIRON.

Q. Did you publish the results of that work?

A. The results were presented at some professional meetings, but there was no full report filed. The study was a feasibility study. It was largely determined what kinds of data would allow what kinds of research questions to be addressed.

Q. Anything that involved benzene or leukemia?

A. Not specifically. I think there certainly are benzene exposures in the coking facilities of a steel plant, as part of the mixture. But we were interested primarily in the PAH exposures there.

Q. All right. I mean, did any of your work specifically focus on benzene?

A. No.

Q. No, you didn't analyze any monitoring results for benzene, in that study; is that right?

A. I don't recall so, no. That's correct.

Q. Have you ever done any consulting work for the CDC?

A. You understand NIOSH is part of CDC?

Q. All right.

A. So, beyond CDC, I've been a peer reviewer for a number of years for ATSDR. I think they are

part of CDC as well. I may be wrong.

Q. Any of that related to benzene or leukemia?

A. They're typically waste site investigations that include the whole mix of contaminants, pollutants. Benzene may have been included, but not specifically benzene.

Q. Do you recall anything specific about benzene in your work for the ATSDR?

A. No, sir.

Q. Have you ever worked for the Texas Department of Health?

A. I don't believe so.

Q. Has anybody ever hired you to determine the causes or potential causes of acute myelogenous leukemia?

A. No, sir.

Q. Has anybody ever hired you to determine the causes or potential causes of any blood disease or cancer?

A. No, sir. I assume you mean to do research on this, these topics specifically.

Q. Right.

A. Correct.

Q. Outside of this particular case, have you ever done any consulting work for Brown & Root?

A. No, sir.

Q. So your relationship with Brown & Root is only with regard to litigation; is that correct?

A. This litigation, correct.

Q. What is your understanding of Brown & Root's business?

A. I don't pretend to know all about it, but as it pertains to this case, I understand that they would contract for large marine construction projects, such as the construction of oil rigs.

Q. Anything else about your understanding about the nature of their business?

A. No. Not specifically. I've seen some references to land-based operations and oil facilities, but I have no further familiarity with those.

Q. Have you done any studies or research of the data to determine disease rates among Brown & Root employees?

A. No, I have not.

Q. Have you done any to determine disease rates surrounding or pertaining to maritime workers in general?

A. No, I have not. And you're referring, again, to primary research?

Q. Right.

A. Yes. I have not.

Q. Have you done secondary work regarding disease rates among Brown & Root employees?

A. No.

Q. Have you done any type of research at all regarding disease rates among maritime workers in general?

A. Right. With regard to this case, I've looked into the literature to see if there are studies published on maritime workers and disease --

Q. And from your report, I take it there's none that you could find?

A. That's correct.

Q. Sir, do you recognize benzene as a carcinogen?

A. Yes, sir.

Q. Do you recognize benzene as a leukemogen?

A. Yes.

Q. Do you recognize it as a poison?

A. Yes.

Q. Do you recognize benzene as being strongly associated with causing acute myelogenous leukemia, in the medical scientific literature?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm very familiar with the epidemiological literature from which that conclusion was derived.

Q. (BY MR. BROWN) And do you agree that benzene is strongly associated with causing acute myelogenous leukemia in the medical and epidemiological literature?

MR. MARTINGANO: Objection to form.

THE WITNESS: Yes, at sufficient concentrations.

Q. (BY MR. BROWN) And you're familiar with the concept of individual susceptibility; correct?

A. Yes.

Q. All right. And that is what, as you understand it?

A. Not all individuals are equally susceptible to the toxic effects of chemicals, or anything else, for that matter.

Q. And that's a true statement; correct? I

mean, that's generally accepted among epidemiologists and medical doctors: that each individual, due to their physical makeup, is different in the way they respond to exposure to a toxic substance; correct?

A. That's generally correct, yes.

Q. You agree that it is generally accepted in

the field of epidemiology that benzene is associated with causing acute myelogenous leukemia; correct?

A. Yes. At adequate concentrations.

Q. All right. And do you know what concentrations or what levels, threshold levels are required that would cause -- of benzene exposure, that would cause an acute myelogenous leukemia in every particular individual?

A. No, sir. I don't think that's known.

Q. The range would vary drastically because of this concept of individual susceptibility; correct?

MR. MARTINGANO: Objection.

THE WITNESS: Presumably.

Q. (BY MR. BROWN) Have you read OSHA's risk assessment or risk estimate on the number of people who are expected to get acute myelogenous leukemia, even with the reduction of the permissible exposure level to one part per million?

A. I have not specifically seen that.

Q. Have you read the American Conference of Governmental Industrial Hygienists' opinions about excess leukemias at one part per million?

A. I have not. These -- I have relied on the primary literature.

Q. Well, do you have an understanding that

because of their concerns of continued excess of leukemia at the one part per million level, that the ACGIH proposes a TLV of benzene at .1 parts per million?

A. I'm not familiar with their rationale. I am familiar with the underlying literature.

Q. You know that to be a case, that they have proposed a lower than one part per million standard for the protection of people exposed to benzene; correct?

A. I'll accept what you say. I have not looked --

Q. Okay.

A. -- at ACGIH's deliberations, no.

Q. When did you first learn personally that benzene was associated with causing diseases of the blood or leukemia?

A. Probably 20 or 25 years ago.

Q. And how did you learn that for the first

time?

A. I began my training in epidemiology in the early eighties, and benzene, by then, was quite a classic topic.

Q. Prior to your training in epidemiology, did you have an understanding that benzene was harmful to

your health?

A. Probably not.

Q. Had you ever been exposed to benzene prior to that time?

A. We've all been exposed to benzene.

Q. How about exposed to pure benzene?

A. It's possible, in the laboratory setting.

Q. Prior -- when you say "possible in a laboratory setting," where would you have been?

A. Either in high school or, more likely, college chemistry classes.

Q. Do you know what benzene looks like?

A. Yes.

Q. What does it look like?

A. A clear liquid.

Q. Do you know what it smells like?

A. No, sir. I can't say I know specifically what benzene smells like compared with any other solvents.

Q. But one thing that you're sure of is the first time you knew it could cause blood cancers or leukemia was when you began your work as an epidemiologist in your graduate studies; is that right?

A. That's correct.

Q. If somebody at one of your school laboratories were providing benzene to you and exposing you and the other students there to benzene, they weren't telling you that it could cause cancer or leukemia at that time, when you were in those labs; correct?

A. That's correct. University laboratories are -- have not been well-controlled workplaces.

Q. And as a person who was in those labs and having friends in those labs with you, you expect and -- that those people who provided that benzene to you would tell you about the known health hazards; correct?

A. If it's known, of course, yeah.

Q. And by 20 years ago, it was known that benzene could cause leukemia; correct?

A. I assume it was known, yes.

Q. Do you have any idea about the state of the art of benzene and how long -- how far back it goes

that it was known and reported that diseases, failed diseases of the blood and cancers of the blood were caused by exposure to benzene?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm aware of there's a long history, but I also would represent that the

Infante study in '77 was probably the focal point for that previous work.

Q. (BY MR. BROWN) Well, let me object to the responsiveness.

My question is, are you aware of the history of the state of the art of benzene and how far back it has been known and reported that benzene could cause fatal diseases of the blood?

MR. MARTINGANO: Objection to the form.

THE WITNESS: I'm familiar with the fact there's a long history and a number of reports.

Q. (BY MR. BROWN) All right. Did you know in 1897 benzene was reported to cause aplastic anemia?

A. I believe that was reported, yes.

Q. You know aplastic anemia to be a fatal disease of the blood; correct?

A. Yes, sir.

Q. Did you know that by 1928, there were reports that benzene could cause leukemia?

A. I agree that there were such reports. I only am careful with wording because these were not epidemiological studies. And anyone can conclude causation. But it wasn't until these situations were studied epidemiologically that would allow me, as an epidemiologist, to say these are causal relation-

ships.

Q. Well, did you know in 1948 that the API, through efforts among the health professionals from the different chemical companies like Mobils, Doctor and Professor Drinker, from Harvard, reported, in its toxicolgical review for benzene that even at that time, there were reasonably well-documented instances of the development of leukemia from chronic exposure to benzene?

MR. MARTINGANO: Objection to form.

THE WITNESS: Yeah. I am familiar with multiple historic reports and their conclusions.

Q. (BY MR. BROWN) You don't need, as an epidemiologist, an epidemiological study to determine that an exposure can cause a disease; correct?

A. That's a philosophical question. I --

Q. Let's go back --

A. If you're talking about gunshot wounds to the head, it's not so difficult. But as you move

toward more complex diseases and more complex pathologies, then it's much more difficult to conclude causation on observational evidence.

Q. How about scrotal cancers among chimneysweeps?

A. That was reasonably well-studied

epidemiologically.

Q. Well, they didn't have what we refer to as modern epidemiological principles back then, did they?

A. Correct. It was intuitive.

Q. How long ago was that?

A. That's about 1600s or something like that, I guess.

Q. They didn't have any greater than twofold increased risk at the 95 percent confidence interval criteria back at that time, did they?

A. Well, I won't imply that that's what's necessary to determine causation, but I understand what you're saying. That's correct. There are observations that are valid, that lead to interventions, public health interventions, without doing modern epidemiological research.

Q. That's exactly my point. There are observations that can be derived or obtained from

other things than a twofold increased risk at a 95 percent confidence interval, such that would be sufficient to have a causal connection; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Yes. Just like stress and ulcers, until H pylori was discovered, until the

true cause was identified, stress was the causal factor.

Q. (BY MR. BROWN) Well, I mean, going back to our original example -- and you've studied polycyclic aromatic hydrocarbons. That's the culprit in the chimney soot that was causing the problems with cancers in the chimney sweeps; correct?

A. Right.

Q. And even back in the 1600s, without modern epidemiology and the twofold, greater than twofold increased risk criteria, at a 90 or 95 percent confidence interval, that relationship was established, and it's even correct and it lives on today; correct?

A. That's right. Many of them have been validated.

MR. MARTINGANO: Is this a good time for a break?

MR. BROWN: Yeah. Yeah, yeah, yeah.

MR. MARTINGANO: Okay. Let's go off the record.

THE VIDEOGRAPHER: The time is 10:38 -- I mean, the time is 11:38 a.m. We are going off the record.

(A recess was taken.)

THE VIDEOGRAPHER: The time is 11:49 a.m. We are back on record.

Q. (BY MR. BROWN) Sir, before our break, we had talked about the association that -- between benzene and acute myelogenous leukemia, which you said was generally accepted among epidemiologists in your field. Do you recall that?

A. Yes.

Q. Are you familiar with the benzene standard?

A. Which?

Q. The OSHA preamble to the 1987 benzene standard.

A. I've probably seen it. I can't recite it, no.

Q. Would -- and that's a large document. I understand you wouldn't be able to recite it. But with regard to that document, do you know of any other single document which more thoroughly analyzes the health hazards of benzene and the epidemiology

that is associated with benzene than the preamble to the OSHA 1987 benzene standard?

A. I'd really have to look at it and compare it with others, but it is a substantial representation of that literature, as of that time.

Q. All right. Well, in the past, for this

case, have you gone back and tried to look at the OSHA benzene standard and determine which parts are no longer valid or which parts are still valid?

A. Oh, no. I'm sorry. I didn't mean to imply that. I look at the epidemiological literature, which is constantly being published and updated. So it could only have benefited from what was known at its time, in its day.

Q. All right. Even in 1987, OSHA makes this statement: "OSHA believes these studies clearly demonstrate an association between benzene exposure and increased risk of leukemia. The agency does not believe this conclusion is now seriously challenged." Do you see that box there in the middle of the page?

A. Uh-huh. Sure.

Q. Do you agree with that statement?

A. Yes.

MR. MARTINGANO: For the record, anyone read in that exhibit number?

MR. BROWN: That was Exhibit Number 8. I'm sorry.

Q. (BY MR. BROWN) Do you see that on --

A. Yes. Thank you.

Q. -- front of the benzene standard? Yeah. Thanks.

Sir, what do you recognize as the accepted credible risk factors of acute myelogenous leukemia?

A. Apart from high-level benzene exposure, I would say ionizing radiation -- again, at an adequately high dose, because we're all exposed to ionizing radiation -- certain chemotherapeutic agents, drug treatments. I think those are the most clearly recognized. And I think among others that continue to be explored are the mixtures of solvents and other -- possibly other solvents.

Q. All right. Do you recall last time, when you gave your deposition back in March of 2006, you listed benzene, radiation, chemotherapy, age? But you didn't list this new one, the solvent mixtures. Have you done some additional research?

A. I'm sorry. I was trying to be responsive and state what was -- what were the known ones. I believe that was your question.

Q. Yes.

A. I believe in both cases I represented the ones that were recognized or known. I simply added that there are others that are -- that continue to be explored.

Q. All right.

A. I didn't say that these are accepted in the

known category.

Q. Let me object to responsiveness.

What, in your opinion, are the risk factors of AML that are generally accepted in the epidemiological field?

A. The ones I stated, minus the general solvents.

Q. All right. So, if I'm correct, what you've said is the accepted risk factors of AML that are accepted among epidemiologists in that field are benzene, radiation, and chemotherapy; is that correct?

A. Yes.

Q. Any others that you can -- you would consider to be generally accepted as causes of AML?

A. Not off the top of my head, no. I believe that I've summarized them as well in the report, so if there's any others, they would be there.

Q. Well, let's take a look at your report.

I've marked it as Exhibit 2. It's also in Exhibit 12. You can feel free to look at whatever copy you'd prefer.

Would it be stated -- first of all, is Exhibit 2, which we have here in front of you, is that a complete and accurate copy of your report in

this case?

A. Yes.

Q. All right. Is your report in final form?

A. Yes.

Q. When did you create it?

A. Last week.

Q. It says the date of May 4th on the top of it; is that correct?

A. That would have been the date that we sent it to Mr. Martingano.

Q. All right. And my question was, when did you create the report that you have marked as Exhibit 2, with the date May 4th?

A. I believe May 4th was Friday.

Q. All right.

A. It was produced beginning the Friday before.

Q. All right. So a week before May 4th, you had --

A. Last week, yes.

Q. Sometime at the end of April, that report was in final form; is that correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: No, sir. I'm sorry. It was begun --

Q. (BY MR. BROWN) Okay.

A. -- a week prior to May 4th.

Q. Okay. You got your assignment in late March. You began your report the last Friday in April, is that right, and then you publish or finalize it on May the 4th?

A. That's correct.

Q. Okay. Did you have any drafts of that report?

A. Yes, sir.

Q. How many?

A. It's an evolving document. In my office we keep one copy, and the people who work on it make all their changes directly to that one copy. So every time someone makes a change to it, it would be the latest draft and different from the previous one. This is the culmination of that process.

Q. Who else besides you contributed to that report?

A. I have a team that includes -- and I believe

participated in this, the preparation of this case --
Diane Mundt, Ph.D. She is my sister and also an
epidemiologist. Linda Cohen, C-o-h-e-n. She's a
master's level epidemiologist. And a technical staff
person.

Q. Who is that?

A. Melanie Kourbage, K-o-u-r-b-a-g-e.

Q. Can you tell me, from looking at Exhibit 2, the contributions from Diane Mundt and the contributions from Linda Cohen?

A. Linda would not have drafted text. I have written the majority of this. I've revised and edited all of this. So this is my final product. Diane Mundt would have assembled the first drafts regarding the relevant literature in the industry, chemical industry and so on.

Q. Can you point those out under the bold headings, if that's one way to refer to it?

A. Occupational benzene exposure and risk of AML, this section is a review of the literature. This is drafted and the relevant literature assembled by staff.

Q. Okay. So it was --

A. Especially on short timelines.

Q. Okay. Diane Mundt developed Occupational

benzene exposure and risk of AML section, which is pages 4, 5, and 6 of this report, and you reviewed that and approved it; is that right?

A. Correct.

Q. Did Diane Mundt draft any of the other portions of your report?

A. I believe some drafting of parts here and there are throughout the report, yes.

Q. Any other portions that you specifically can point out?

A. No.

Q. Did she draft all of this report?

A. No.

Q. Which parts were originally and only drafted by you and approved by you?

A. (Examining document.) I'm pretty sure I wrote the part about my qualifications.

Q. Okay.

A. General methodologic approach. I probably -- I drafted this paragraph, into which my staff inserted the specific search terms that they used to unearth the literature. We've spoken -- let's see. Linda Cohen provided the background information for the overview of AML. She has a biology background and may have contributed some at

least verification of information there. The rest of that was my authorship.

We've spoken about the review of the epidemiological literature. That was begun by Diane. I drafted the section on benzene -- Mr. Clark's alleged benzene exposure. And all of the staff

worked and contributed toward verifying those statements in the voluminous case documentation that I received.

Q. Did you feel you had sufficient time to prepare the report in its final form?

MR. MARTINGANO: Objection to form.

THE WITNESS: The report, as it stands, reflects what I would like to say in this case.

Q. (BY MR. BROWN) All right. You're not going to be providing any other opinions or factual observations with regard to your opinions as an epidemiologist in this case, that are not stated in this report; is that correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Correct, unless there is more information provided that would impact these -- this, such as exposure information.

Q. (BY MR. BROWN) You -- well, you're not aware of any exposure data for Mr. Clark, in terms of

industrial hygiene monitoring data; correct?

A. There's -- I'll be blunt. There's a clear lack of any evidence of exposure, so I have a hard time commenting about such exposure.

Q. Well, let me object, responsiveness, and I'll talk to that -- about that in a minute.

My question was, you're not aware of any industrial hygiene monitoring data for exposure analysis of Mr. Clark; correct?

A. I'm unaware of any industrial hygiene monitoring data.

Q. And you have not seen any summaries of any such data; correct?

A. Correct.

Q. And to your knowledge, you don't even know if Brown & Root ever monitored any of their workers to determine if they were being overexposed to benzene; correct?

A. I don't even know if benzene was present, but correct.

Q. Well, let me object to responsiveness.

To your knowledge, do you know whether or not Brown & Root ever monitored any of their workers, such as Mr. Clark, to determine their exposures to benzene?

A. I don't know one way or the other.

Q. Did you know that since 1958, it's been the law in Texas that employers had an obligation to not overexpose workers to benzene above the accepted exposure limit of 25 parts per million, back in 1958?

A. That sounds prudent.

Q. Did you know that was the law in Texas?

A. No. No. That's the first I've heard of Texas law.

Q. Would you know of a way, as an epidemiologist who has, at least by your statement, some experience with industrial hygiene, would you know of a way for a worker to -- for an employer, rather, to evaluate a worker's exposure to benzene in terms of 25 parts per million, without doing industrial hygiene monitoring?

A. Well, that assumes -- I think you folks call it foundation -- that benzene was present. I think in a workplace where benzene was known to be present, one could and should monitor for worker exposures.

Q. Well, again, let me object to responsiveness.

My question was, do you know of a way, as an epidemiologist, that an employer could detect levels of benzene at 25 parts per million back in 1958,

without doing industrial hygiene monitoring?

A. No.

Q. Do you know what the odor threshold of benzene is?

A. I believe there are a number of reports that suggest a level at which it can be perceived. Again,

there is biological variability in our senses as well.

Q. And what is your understanding of the odor threshold of benzene?

A. I believe I've seen references in the -- as much as a hundred or more, before it's detectable, reliably.

Q. A hundred or more parts per million?

A. Yes.

Q. With regard to -- well, back at the -- you -- would it be your opinion that an employer would have an obligation to make sure that they were not overexposing their employees to hazardous substances?

A. Yes. This is good practice -- it's not epidemiology. This is --

Q. It's just common sense?

A. -- common -- I mean, as a general member of the population, one could answer that question

correctly.

Q. I believe you've even stated in your prior trial testimony that employers, not only did they have an obligation to protect -- protect their workers; they had an obligation to study their workers. Do you recall that?

A. Yes.

Q. And do you agree with that, still?

A. I do.

Q. And is that a new concept, or is that a concept that you think has been prudent, going back for a number of years?

A. Well, I think, in general, it's prudent, but I think it's necessary where hazards are unknown. So it would be a difficult call where one already knew, clearly, the hazards of a material. It's a different issue. It's an ethical obligation, then, to protect employers -- employees. But I think -- I feel strongly that where risks of materials are unknown, there is an obligation to study.

Q. And when you say there is an obligation to study, you mean epidemiologically?

A. Study as in monitoring environment or studying health effects, yes.

Q. Disease rates?

A. It's not just limited to epidemiology, is what I wanted to say.

Q. All right. You should study them -- study the air they breathe in terms of industrial hygiene monitoring, is what you mean; correct?

A. Correct.

Q. You study their biological effects of any ill effects they may be experiencing through contacts with agents in their job; correct?

A. That's correct.

Q. And that should have been -- those kind of activities should have gone on in the sixties and seventies; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm not sure, after saying this is generally true, I would focus on sixties and seventies.

Q. (BY MR. BROWN) I would just say as far back -- what I don't want to get at is that you come up at trial and say, "This is all a new concept and not until the 2000s should somebody have been doing that." These things, you would agree, employers should have been testing and studying their workers before Mr. Clark ever started work at Brown & Root; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Well, I think your first part of your question refers, in general, to employers. I'm not sure exactly what it has to do with Mr. Clark and Brown & Root. But I would agree with the general -- the beginning of your

question.

Q. (BY MR. BROWN) Okay. In general, employers should have been testing workers and studying their work force to determine if they were experiencing ill effects or being overexposed to certainly chemicals, dating back into the fifties and sixties, in general; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: In general, yes. And I think it became a legal obligation under the OSHA.

Q. (BY MR. BROWN) All right. And you weren't even aware that the Texas Department of Health had a regulation in 1958? You weren't aware of that; correct?

A. That's right. You mentioned that.

Q. With regard to the drafts of the report, did you save any of your drafts?

A. This is the draft. I think I explained that there is one document to which all people add

comments. Now -- oh, if you mean if they're split off and saved along the way, no.

Q. All right. So if something needs to be changed, it's deleted and it's gone for good?

A. This is it. It goes to the same document.

Q. Were any of --

A. Until it's submitted.

Q. Okay. Were any of the drafts or any changes made to your report, that we've marked as Exhibit 2, after speaking with Mr. Martingano or anybody from his firm?

A. I didn't speak to Mr. Martingano or anyone from his firm between the Friday he asked me to prepare the report and 9:45 this morning.

Q. Okay. How about anybody else that helped to prepare this report?

A. I believe the only correspondence with our offices was arranging this meeting; that there was no reaction to this report since it was submitted.

Q. All right. So nobody -- your testimony is, no one from your office spoke with Mr. Martingano or anyone from his firm concerning this report, prior to you signing your name on it?

A. That's correct. Or since.

Q. When you prepared your report, did you have

the deposition of Mr. Clark?

A. Yes, sir.

Q. Did you have the deposition and affidavits of his coworkers, where they described their exposures to benzene and Mr. Clark's exposures to benzene?

A. Yes, sir.

Q. Did you have the deposition testimony of Mr. Clark's treating physician at M.D. Anderson?

A. That, I don't know.

Q. Did you have the medical records from Mr. Clark, from M.D. Anderson, where it says, from the very first day that he went and sought treatment there to save his life from this disease he has, that he was asked if he had chemical exposure, and he told them he had exposures to benzene?

MR. MARTINGANO: Objection.

MR. BROWN: Did you see that record?

MR. MARTINGANO: Objection to form.

THE WITNESS: Well, as you've represented, I didn't see that exactly. I did see that he sought medical treatment, and I did see that a physician volunteered with a possible cause, such as chemical exposure.

Q. (BY MR. BROWN) Well, let me object to

responsiveness.

You're not saying that a physician volunteered something. You understand when a person goes to a place like M.D. Anderson and is trying to get his life saved because he has a fatal, terminal illness, that a history is taken of him; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I understand that history-taking is a routine process in medical practice, for whatever reason one is going to a physician.

Q. (BY MR. BROWN) And a prudent oncologist, when taking a history, would ask the person about potential risk factors; wouldn't you agree?

A. Risk factors?

Q. Risk factors of cause of their disease, and in particular in Mr. Clark's case, his AML?

A. See -- I'm sorry. Your question was -- lacked specificity.

Q. I'm sorry.

A. A physician would ask a patient whether he or she had had benzene exposure, chemotherapy, or radiation exposure. That seems reasonable if that treating physician knows what the risk factors are for the disease.

Q. All right. And do you have any reason to believe that the reason that benzene is mentioned in his medical records at M.D. Anderson the first time he ever presented there was anything other than a response that he gave to a physician doing her job in asking about what potential risk factors he had in

terms of what may have caused his AML?

MR. MARTINGANO: Objection to form.

THE WITNESS: That sounds reasonable. I have no idea what was asked or what the reason for asking was.

Q. (BY MR. BROWN) And you haven't seen his -- her deposition, as I understand your testimony?

A. I did not dwell on a lot of the medical record information, because the diagnosis of de novo AML was clear throughout the record.

Q. Well, you said you didn't dwell on it. Did you see Dr. Williams [sic], Mr. Clark's oncologist, what her definition of de novo leukemia was?

MR. MARTINGANO: Objection to form.

THE WITNESS: I may have seen it, but I'm not expert in medical diagnosis.

MR. MARTINGANO: And just to be fair, Darren, this deposition was just taken, and he has not seen it, so -- I mean, I'm not trying to

trick you.

MR. BROWN: Okay. And I said "Dr. Williams." It's Dr. Thomas.

MR. MARTINGANO: Thomas.

MR. BROWN: I'm sorry.

THE WITNESS: Not having seen it, it was the

same to me.

Q. (BY MR. BROWN) What's your definition of de novo leukemia?

A. My understanding of it -- I'm not capable of defining it, as you might medically -- is a leukemia that arises without precursor, either known exposure, high exposure, or myelodysplasia or blood dyscrasia. It's, quite frankly, a -- idiopathic.

Q. And who gave you that understanding?

A. From my reading and study of the literature.

Q. What literature? What literature do you rely upon to get that definition?

A. To get my understanding?

Q. Yes, sir.

A. It's broadly. There are -- I'm not sure if it's included in something like this, but I've looked at a number of publicly available textbook type... (Indicating.)

Q. All right. What are you referring to there?

A. I'm not intending to refer to anything specifically. I'm saying I can't recount exactly what documents that might have contributed to my understanding of de novo.

Q. The de novo leukemia that you reference is the de novo leukemia that is referenced by Dr. Thomas

in Mr. Clark's medical records; is that correct?

A. Yes.

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) Mr. -- or Dr. Thomas was asked what she meant when she said "de novo leukemia." Let me just read it, and I'll show you.

Mr. Martingano asked, "Well, what do you mean by saying 'de novo AML'?"

Her answer was: "Means it's newly diagnosed, as opposed to a relapse or refractory."

Did I read that correctly?

A. I trust your reading.

Q. Is that your understanding of the diagnosis, sir?

A. I think that's fair. I'm not in a position to critique that.

Q. So you don't know --

A. It seems compatible with my understanding, yes.

Q. Okay. And, anyway, she's the one who wrote it in his medical records, and that's what she thinks it means, according to her testimony; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have no reason to doubt her testimony.

Q. (BY MR. BROWN) What's your definition of a secondary leukemia?

A. My impression would be those that are not de novo, that followed some other identifiable marker or event. I do understand that Mr. Clark had blood work prior to his diagnosis, that didn't suggest an underlying myelodysplasia. That's really the root of my understanding of that aspect of this case.

Q. All right. Let me object to the responsiveness.

My question was, what's your understanding of the definition of secondary leukemia? I think your answer was "anything that's not de novo"; is that correct?

A. Yes.

Q. Would secondary leukemia, in your mind, equate to a leukemia that was -- that occurs as a result of chemotherapy treatment for another primary cancer?

A. I believe so, yes.

Q. All right. Let me read to you Dr. Thomas's understanding and definition of secondary leukemia. She's asked, by Mr. Martingano, on page 28 of her deposition, "You're familiar with the concept of secondary leukemia?"

Her answer was: "Yes."

"Can you tell me what that means?"

Her answer was: "That generally refers to a leukemia that is suspected to be related to a prior exposure, usually referenced to chemotherapy exposure."

Did I read that correctly?

A. Yes. I'm glad I got that one right.

Q. And that's your understanding as well; is that --

A. That's my impression, yes. Again, I'm not in a position to critique these on a technical basis.

Q. Okay. And have you used de novo leukemia or secondary leukemia or idiopathic leukemia in any way in formulating your opinions in this case?

A. Yes.

MR. MARTINGANO: Objection.

Q. (BY MR. BROWN) Tell me how you've done that.

A. Based on what we've just discussed, but not

that deposition, which I have not seen, the medical records indicating that Mr. Clark's AML was de novo, has implications for the interpretation of the epidemiological literature.

Q. Well, it's your testimony that you would agree with her that when she's wrote "de novo" in

his -- for his diagnosis of leukemia, she meant it was never -- a leukemia that had not previously been diagnosed?

MR. MARTINGANO: Objection to form.

THE WITNESS: Well -- I'm sorry. I said that was compatible with my understanding.

Q. (BY MR. BROWN) Okay.

A. If you look at the universe of de novo and secondary, you might define de novo as those that are not secondary. And she says secondary one is as a result of a chemical exposure. So if he -- she indeed used her term and her definition, one could logically argue -- and I'm not an expert on this -- that, therefore, it was not a chemically-induced one.

Q. All right. Let me object to responsiveness.

You agree her definition is not the same as the definition of de novo leukemia that says "this leukemia is idiopathic or we don't know the cause of this leukemia"?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm sorry. Technically, I don't have the background to argue this. It sounds like semantics. If it hasn't been diagnosed before or if it -- there has been no indication of it, it gives rise to it, there's no

reason to believe that it existed before that point in time, it seems compatible, my understanding and what you've read from that deposition.

Q. (BY MR. BROWN) So you're saying if de novo means we don't know what caused this particular leukemia, that's the same as de novo meaning this leukemia has never been diagnosed before; this was newly diagnosed? Those are the same to you?

A. I didn't say they were the same. I said they're compatible.

Q. Okay.

A. If there was no indication of it existing before, it is de novo.

MR. BROWN: We need to stop and change the tape. It would be a good time, I guess, to take another quick break.

MR. MARTINGANO: Yeah. Okay. Sure.

THE VIDEOGRAPHER: The time is 12:18 p.m.

We are going off the record.

(A recess was taken.)

THE VIDEOGRAPHER: The time is 12:22 p.m.

We are back on record.

Q. (BY MR. BROWN) All right. You don't dispute that plaintiff Mr. Clark actually does have acute

myelogenous leukemia; correct?

A. Correct.

Q. That's a medical diagnosis, and that's not your area; correct?

A. Correct.

Q. We were looking at your report that you've marked as Exhibit Number 2, or that we've marked as Exhibit 2. All right. At the top of page 3, it says you've critically assessed Mr. Clark's potential exposure to benzene while working for Brown & Root as a rigger on a construction barge. Do you see that?

A. Yes.

Q. You say, "No direct evidence of benzene exposure or use has been produced, and my assessment is based on the deposition testimony of plaintiff's industrial hygienist report," and you continue on there. What do you mean, you critically assessed the potential for exposure? What did you do?

A. Well, this is a general approach. Critical

assessment is to look at whatever evidence exists and to say, "Does this impact my opinion with respect to the relationship between exposure and disease?"

Now, we established that -- in the next paragraphs, that benzene is capable of causing leukemias.

Q. Okay. Let me stop you there. Let's talk about the critical exposure assessment that you did. Really, all that you did was, you had some information that there was no benzene on this barge, and you compared that to what plaintiff said, and it's your conclusion that there's no benzene on the barge, so, therefore, there was no exposure; is that right?

MR. MARTINGANO: Objection, form.

THE WITNESS: No. I think this is clear. This says there's no evidence beyond these -- this oral testimony of Mr. Clark and his coworkers. So, admittedly, there's very little to critically assess. Normally, we have purchase or requisition records or exposure monitoring, and the critical assessment would include all forms of evidence supporting the claim of exposure.

Q. (BY MR. BROWN) You're saying, normally, it's

the normal case that you have evidence of benzene purchase records to look at in a case like this?

A. I'm saying it's -- my experience is normally, -- my understanding -- the plaintiff's burden to document that such exposure took place or that there are available records that say, "Yes, this

was -- this material was shipped to this barge," for whatever reasons.

Q. I'll agree it's our burden to prove it, and I'll agree it's a lot harder to prove when Brown & Root destroys all of its sales documents. Do you know anything about how they kept their documents and their document retention policy?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have no background in this area. I have no knowledge of record retention practices.

Q. (BY MR. BROWN) All right. Have you even asked?

A. No. I have been asked to review the materials produced in this case.

Q. All right.

A. And I have, as in any other case, critically assessed those records that have to do with the exposure, and there are none.

Q. In your critical assessment, did you even ask, "Are there any benzene purchase records available for the period that Mr. Clark says that he was exposed to benzene?"

A. I did not ask for those things, no.

Q. Don't you think those are important types of

information if you're going to make a critical assessment?

MR. MARTINGANO: Objection, form.

THE WITNESS: Let me clarify that my understanding of my role is to critically assess what has been produced through discovery. And I also understood, as you reiterated, it's plaintiff's burden to produce those, through discovery. And all of that, I assume, has taken place in the months or years prior to my involvement, over the last few weeks.

Q. (BY MR. BROWN) Has it been your experience, sir, in your working for all these companies, that plaintiffs, the hourly workers typically get -- keep copies of purchase records of the chemicals that they're required to use in their job?

MR. MARTINGANO: Objection, form.

THE WITNESS: It's my understanding that the industrial hygienists that are working on behalf

of those people would seek and produce, through discovery, such records if they exist.

Q. (BY MR. BROWN) Let me object to responsiveness.

My question is, has it been your experience that somebody who worked by the hour back in the

1970s would have kept up with records on how -- the chemicals he used and purchase records and that type of thing, invoices, that's not typical, is it?

A. I didn't say that the plaintiff or an hourly worker would have those. I would say that those should have been requested, if they exist, and I don't think it's my responsibility to ask for them, if they do exist.

Q. Okay.

A. I do believe that an hourly worker who is working in a dangerous trade and is participating in safety meetings and is provided safety manuals from the company has some responsibility to look at those and to understand the materials that he is provided.

Q. Right.

A. If he's not provided them, then I think there's a lapse on the employer's part.

Q. Okay. Let me object to responsiveness.

Would it be a lapse on the employer's part

if any of the materials that they provided their riggers and barge workers didn't mention any hazard with regard to benzene --

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) -- by the 1970s?

A. That's a trick question. Assuming there was

benzene supplied, then you might have a different answer.

Q. Well --

A. If I don't provide benzene to my workers in the field, I'm not sure that I have an obligation to warn them about the safe handling of benzene.

Q. Did you read the affidavit of Mr. Clayton Williams, sir?

A. (Examining document.) Yes.

Q. All right. Read the highlighted portion there, if you would, please.

A. "The crew members, including Mr. Clark, would wash their hands, tools, and clothes in benzene on a daily basis. Benzene came from 55-gallon drums on the barge."

Q. Do you have any personal knowledge of benzene being used or not used on any of the barges that Mr. Clark worked on?

A. No. I've seen no evidence to support the

presence or absence of benzene on the barge.

Q. And you never observed Brown & Root workers doing their work during the 1970s, installing off rigs out in the Gulf, cleaning the hammers, cleaning the barges, and any of the solvents that they might used; correct?

A. I have not been present in those settings.

Q. You have not been provided with any invoices or purchase data for the chemicals that they might have used; correct?

A. I have not seen any --

Q. All right.

A. -- purchase records.

Q. You have not been provided with any industrial hygiene monitoring data for any of the chemicals that they might have used as cleaning solvents; correct?

A. Correct.

Q. I mean, it -- whatever cleaning solvent they used, if the law required that workers not be exposed, over certain levels, to those chemicals in the cleaning solvents, the employer should have been monitoring for those and making sure that the employees were not being overexposed; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I agree with the law, however it's actually stated, yes.

Q. (BY MR. BROWN) All right. If -- and if -- the law -- do you have an understanding that the law requires that monitoring records be kept for 30 years?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm not familiar with the specifics of the law, but that makes sense.

Q. (BY MR. BROWN) All right. Well, if the law requires it, then the records from the seventies ought to still be around; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Depending on how late in the seventies. The principle is correct. I'm just challenging your math.

Q. (BY MR. BROWN) Have you seen the affidavit of Mr. McGinnis, that we've marked as Exhibit 4?

A. Yes, I have.

Q. What does he say in the highlighted portion there?

A. The same: "While working for Brown & Root with Aubrey Clark in the 1970s, we used benzene to clean our hands, tools, gloves, clothing and equipment. We were provided the benzene by

Brown & Root, and the benzene was in barrel racks on the barge. We used the benzene on a routine, daily basis for several years."

Q. And you read Mr. Clark's testimony, where he used benzene from the time that he began out there, in either late '71 or '72, through the late

seventies, around '77 time period, where he used benzene on a frequent, regular basis to spray off the lubricating oils from the hammers and to clean off the barges with it and to clean their hands and tools? You read all that; correct?

THE WITNESS: I've read that.

MR. MARTINGANO: Objection to form.

THE WITNESS: I've read it, and that's essentially what he says.

Q. (BY MR. BROWN) Do you consider that to be no evidence of exposure? Just because it's some man's sworn testimony, do you say it's no evidence?

MR. MARTINGANO: Objection to form.

THE WITNESS: I was referring to evidence as documentation. I think that --

Q. (BY MR. BROWN) Well, that's not the word -- excuse me. That's not the word you used. You used evidence. You didn't say there's no documentation. You said there's no evidence.

A. And now I'm defining what I mean by evidence.

Q. Okay.

A. Certainly, these gentlemen's testimony is evidence. It's what we have because -- and have to rely upon, if it's believable, because we don't have

more concrete, typical evidence of exposure, such as the records, the types of records we discussed earlier.

Q. Well, do you have any reason to dispute the testimony of Mr. McGinnis, Mr. Williams, Mr. Clark, and the other coworkers who have testified that they all used benzene out there when they were working on those barges in the seventies?

MR. MARTINGANO: Objection to form.

THE WITNESS: Well, I'm not sure that I've seen all other employees, as you've referred to. And I recall there's another employee of Brown & Root, testifies that there was no benzene. I agree that all three state essentially the same position, with essentially the same language. I have a hard time finding it particularly credible, given the evidence I was also provided in the Brown & Root safety manuals, talking about the use of solvents with low flash

points.

Q. (BY MR. BROWN) All right. Well, let me object to responsiveness.

You're saying you don't believe what they're saying; is that right?

MR. MARTINGANO: Objection to form.

THE WITNESS: Excuse me. I believe your question was, Do I have any reason to not believe? And I do have reason not to believe. One is, they have recited a similar statement, yet they have not been able to describe what other chemicals are there. They've not been able to tell what it was replaced with. There is a particular focus on this one thing, and from an epidemiological perspective, it's not unusual.

There are studies that document responses, in scientific studies, where no one intends to be biased, answers are given from a particular perspective, that is -- may or may not be representative of what actually happened.

In case control studies, there's a thing call reporting bias. People who have been diagnosed with specific diseases tend to either recall better or overrecall, relative to the comparison group, certain exposures. Not that

it's intentional. It's human nature.

There are studies that show that even studies of people involved in litigation overreport or don't reliably report what has occurred.

So, taking my understanding of how people

provide information for research purposes, I can see that there's some parallels with the testimony that these gentlemen provide. And it causes me, in light of the other testimony, of the other employee, and the documents that would preclude the use of this type of exposure or this type of solvent in such settings, for me, cause me to doubt the truthfulness of that testimony.

Q. (BY MR. BROWN) All right. Let me object to responsive.

Sir, do you believe Mr. Clark and his coworkers when they say they were exposed to benzene or not?

MR. MARTINGANO: Objection to form.

THE WITNESS: Could you repeat that?

Q. (BY MR. BROWN) Do you believe Mr. Clark and his coworkers when they say they were exposed to benzene while working for Brown & Root in the 1970s?

MR. MARTINGANO: Objection to form.

THE WITNESS: I find it difficult to believe that they would use benzene in the ways they have described --

Q. (BY MR. BROWN) So you don't believe --

A. -- in such quantities and spraying about the deck of the barge.

Q. You don't believe them, and that's what your testimony is to the jury; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm saying that the way that they have described the use of a solvent, and they, in other places, in deposition, have stated that, yes, they may have used other solvents, they may have used diesel, that I think that there's more information that should have been made available, should have come out from these gentlemen, about the variety of chemical substances they used.

Q. (BY MR. BROWN) Well, let me object to responsiveness.

My question is -- can you answer for the jury with a simple yes or no answer? -- do you believe these fellows when they say they were exposed to benzene or not?

MR. MARTINGANO: Objection to form.

THE WITNESS: I find it implausible that they could have used benzene the way they have described it.

Q. (BY MR. BROWN) All right. You're not a human lie detector, are you, sir?

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) You're not --
A. Is that a serious question?
Q. That is a serious question. This is a serious case, and what my point is, is you're not -- you don't have any better ability to evaluate, as an expert or anybody else, whether somebody is telling the truth than the jury; correct?
MR. MARTINGANO: Objection to form. Darren, I think he's answered your question, and because he has, I think you've asked it three or four different times the same way; he's answered it the same way. I think you just need to move on.
Q. (BY MR. BROWN) Sir, you're not in any better position to evaluate whether these people are telling the truth than the jury, are you?
MR. MARTINGANO: Objection to form.
THE WITNESS: What I've said is that I don't find the testimony plausible, as stated, based on my understanding of the explosiveness, the

volatility of benzene, and the ways that they've described using it around welding.

Q. (BY MR. BROWN) Okay.

A. This is not -- I'm not testifying as to whether or not they lied. I find that portion of the testimony incomplete and unreliable, for purposes

that it's being used.

Q. Well, let me object to responsiveness.

Bottom line is, you don't agree with them. That's okay. I mean, I'm not asking you to agree with them. But my question was, you are in no better position to evaluate whether these gentlemen are telling the truth or not telling the truth than the jury would be in this case? You're not an expert on whether somebody's telling the truth or not, are you, sir?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm not commenting on whether or not they're telling the truth.

Q. (BY MR. BROWN) All right. You're not an expert on whether somebody is telling the truth; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: In general, no. If somebody tells me something that's implausible, I don't

need to be an expert on whether or not they're lying or telling the truth.

Q. (BY MR. BROWN) Do you think you could tell better than the people who would sit on this jury whether these people are lying or telling the truth?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have no concept of who the jury might be made up of.

Q. (BY MR. BROWN) Do you have any --

A. If people who have handled benzene around ignition sources understand the situation, then they may well agree with my understanding, from an occupational health and safety perspective.

Q. Let me object to responsiveness.

My question is simple: Do you think you're in a better position to evaluate whether these people are being truthful or not than the jury, as an expert, on whether somebody's telling the truth or not?

MR. MARTINGANO: Objection to form.

THE WITNESS: I can't answer that.

Q. (BY MR. BROWN) Okay.

A. It's --

Q. Fair enough.

A. It's not a question that has anything to do

with my answer.

Q. In the field --

A. And my opinion.

Q. In the field of epidemiology, they don't train you to determine whether or not somebody's providing you with truthful information, do they?

A. Perhaps --

MR. MARTINGANO: Objection to form.

THE WITNESS: -- I wasted an earlier answer. I said, in epidemiology, we are very interested in the quality and the validity of the information that we obtain, and we go through painstaking procedures to prevent bias from occurring in information. I'm applying these principles to the setting, and it strikes me that there's room for bias in these responses.

Q. (BY MR. BROWN) Well, let me object to responsiveness again.

Sir, in your epidemiological training, did they have a class on how to tell if somebody's lying or telling the truth?

A. No.

Q. All right. Do you have any studies that would -- you could point to to say, "Here's a study that is peer-reviewed, published, that shows that

George McGinnis and Clayton Williams and Mr." --

MR. MARTINGANO: Objection.

Q. (BY MR. BROWN) -- "Clark are lying"?

MR. MARTINGANO: Objection to form. Darren, I think you've asked this question over and over. And, I mean, to ask an epidemiologist study about

what two guys in a case said? Let's just move on.

THE WITNESS: Of course not.

Q. (BY MR. BROWN) Sir, have you --

A. Of course not.

Q. Do you have a study that you think has any bearing on what these people say they used out there, that you're going to show in front of a jury, that, "Here's a study that I'm going to use to support my opinion that what these guys are saying is not true"?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm sorry. It seems like a number of negatives. Can you state the question in a positive?

Q. (BY MR. BROWN) Sorry. Yes. Do you have a study that you will present to a jury, that says, "Here's a study that supports my opinion that what all these fellow are saying -- Mr. McGinnis, Mr. Clark, and Mr. Williams -- about benzene exposure

is not true"?

MR. MARTINGANO: Objection to form.

THE WITNESS: No. I think what I would point to are the safety manuals that point out the serious risks of using benzene in that way.

Q. (BY MR. BROWN) Can you pull out the safety

manual and show me where it is mentioned in the safety manuals that you looked at and reviewed, exposures to benzene are dangerous or exposures to benzene are harmful or that they should not use benzene for any purpose while they're out there on the barge?

MR. MARTINGANO: Objection to form.

THE WITNESS: Not specifically. No. That's not what I said, but no, I can't do that.

Q. (BY MR. BROWN) Can you point, in the safety manual that you referred to, where benzene is mentioned one time?

A. I recall that the flash point for benzene is published in that manual.

Q. All right. Can you show me that?

A. No. It's here. (Indicating.)

Q. It's on that disk? You know, well, that's the problem with getting stuff in electronic form. We can't look at it right now. But it's your

testimony that benzene was mentioned and the flash point of benzene was given; is that right?

MR. MARTINGANO: Objection to form.

THE WITNESS: I recall so.

Q. (BY MR. BROWN) All right. Which safety manual was it? Which version?

A. I don't recall.

Q. Was there anything about benzene, other than its flash point, that you recall?

A. I don't recall any, no.

Q. Was there anything about benzene being a carcinogen?

A. Not that I recall.

Q. And had there been a reference to benzene being a carcinogen, don't you think you would have remembered that, had you seen it?

A. Not necessarily. And that's not the place I would go to find authoritative source on whether benzene was a carcinogenic. It was also well-established before I ever looked at the health and safety manuals.

Q. Well, I understand that, but you're saying you used the safety manual to -- as a way that you think that benzene was not being used. And the only reference to benzene that you can recall, as you sit

here, is that the flash point of benzene was given. There was no mention of benzene, at least to your recollection, that it was a cancer hazard; right?

MR. MARTINGANO: Objection to form.

THE WITNESS: I think that's a fair representation. The reason I raised it and point

to the safety manual is specifically for the extreme hazard of explosion. I think if it's not used in settings where explosion is possible, then the rest is moot.

Q. (BY MR. BROWN) All right. So is it your testimony that industry didn't use flammables as solvents to clean with, in the 1970s?

A. I have never said that.

Q. Do you know naphthas were used in the sixties and seventies, and even in eighties, as solvents to clean with?

A. Correct. And --

Q. You know naphthas are flammable?

A. -- one of the witnesses testified he used diesel, obviously a flammable.

Q. All right. So you recognize that flammables were used as a cleaning solvent by that industry in the sixties and seventies; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Solvents were used, yes.

Q. (BY MR. BROWN) And solvents --

A. And many solvents are flammable and have flash points of different -- at different levels.

Q. And... All right. The bottom line is that there's nothing you know, of your personal knowledge

or any documents that you've seen, that would contradict anything that these gentlemen have said about their benzene exposures; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I think if you substitute in solvents -- because I'm not sure that anyone knows exactly what substances were used -- then I would have an easier time accepting those statements.

Q. (BY MR. BROWN) But they used benzene. And you don't have anything, of your own personal knowledge, because you weren't there, you haven't evaluated their work programs, to say, "These gentlemen are wrong about that" -- you can't say that of your personal knowledge; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I was unable to observe any of these processes on the boat, so --

Q. (BY MR. BROWN) You haven't observed

Brown & Root workers; you haven't observed any maritime workers doing this kind of work; correct?

A. That's correct.

Q. All right. And you don't -- you have not seen any documents that would prove this, that this was not benzene?

A. Or that it was. Exactly. I have -- I share that concern.

Q. So, basically, what you have to do is, you know, as a paid expert by Brown & Root's lawyers in this case, you come to opinion that these guys are wrong about what they say they used to clean up with; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Well, I didn't say that. And what I come to the table with is an epidemiologist, regardless of who hires me. And what I say is that I evaluate information as provided. If this were information provided for an epidemiological study, I would have serious reasons for doubting the conclusions of that study.

Q. (BY MR. BROWN) Okay. Let me object to the responsiveness of the last question.

Have you evaluated the occurrence of AML in

the U.S. population?

A. Yes.

Q. And what is it?

A. As it says in the report, there will be, in 2004 [sic], an expected 13,000 new cases.

Q. All right. Well, we're past 2004, so --

A. I'm sorry. -7. I misspoke. It says 2007 in the report.

Q. Okay. So, I mean, what's the total expected leukemia, AMLs, in the United States in 2007?

A. 44,000 new leukemia cases expected to be diagnosed in 2007.

Q. How many of those are AMLs?

A. It's expected about 13,410 new cases of AML.

Q. And where did you get that information?

A. From the -- there's a reference at the bottom of the page. I believe that's the American Cancer Society. Here it is. (Handing document.)

MR. MARTINGANO: And, Darren, just --

MR. BROWN: And this is your notebook over there?

MR. MARTINGANO: Right, as Exhibit 13.

MR. BROWN: Exhibit 13, okay.

Q. (BY MR. BROWN) All right. When we list the risk factors, you said benzene, radiation,

chemotherapy, and that was all you mentioned in terms of risk factors that were relevant for this particular case; is that correct?

A. Yes, sir.

Q. All right. Do you recognize smoking as a risk factor?

A. Yes, sir.

Q. Do you have an opinion as to whether smoking played any role in the development of Mr. Clark's AML?

A. As I state in my report, I have chosen not to offer an opinion on that, because the documentation of Mr. Clark's smoking history was conflicted from the very sources where it's reported.

Q. And what was the conflict?

A. We have testimony from Mr. Clark that he was never a smoker or only bummed cigarettes, to a medical record suggesting as much as four packs per year. I mean four packs per day. Excuse me.

Q. All right. And you've read -- have you read Dr. Natelson's deposition?

A. No, sir.

Q. All right. I'll represent to you it's Dr. Natelson's opinion that smoking did not cause or contribute to Mr. Clark's AML, okay. If that was

Dr. Natelson's opinion, would you be in a position to contradict that?

MR. MARTINGANO: Objection to form.

THE WITNESS: I would have to review the epidemiological literature on that, because I believe Dr. Natelson would be relying on

epidemiology as well to formulate his opinion. But I also have no reason to doubt his testimony, if that, in fact, is true.

Q. (BY MR. BROWN) All right. How much -- let me ask you this: If a person had a four to -- or five- to seven-pack year smoking history and had cessation of a smoking history, completely, as either 1997 or 1998 time period, would that, in your opinion, be a risk factor for that particular person's AML?

A. It probably -- it probably would have -- the risks would have attenuated with additional time since quitting. Whether that itself was a sufficient pack year history to increase risk, I'd have to look at the epidemiological literature specifically on that topic.

Q. Well, have you done that?

A. No.

Q. Do you have any study that you could show me

and the jury today that says smoking -- a smoking history of five to seven pack years, with a cessation of seven to eight years, would result in any doubling of the risk of AML?

A. Not off the top of my head.

Q. What is the minimum level of smoking where

you think would be contributory to an AML?

A. I don't know offhand. I'm not sure it is known, especially with --

Q. Have you done any research?

A. I have not researched that topic, no.

Q. And you have not put those into your report or your opinions in this case; correct?

A. That's correct. I reacted to what was made available, which wasn't clear enough for me to take it further, so I --

Q. Well, what if --

A. -- not rendering an opinion on the smoking history at all.

Q. You're not going to be rendering one on the smoking history at trial; is that correct?

A. That's correct.

Q. Do you know the mechanism, sir, by which benzene induces or causes acute myelogenous leukemia?

A. I'm familiar with it. I'm not a

toxicologist.

Q. Well, sir, my question is, do you know the mechanism by which benzene causes acute myelogenous leukemia?

A. No.

Q. And you told me earlier you read the OSHA

benzene standard; correct?

A. Well, yes. I'm familiar with it.

Q. All right. And, in fact, in the time they published this document, "The exact mechanistic interaction of benzene and its metabolites with cellular DNA, which eventually leads to human cancer, is not known." Do you agree with that statement?

A. Certainly. No reason -- let's say I don't have any reason to doubt it.

Q. All right. That's not your area of expertise anyway, is it?

A. Correct.

Q. That's the area of the expertise for our toxicologist; correct?

A. Correct.

Q. And do you know who DuPont -- strike that.

Do you know who Brown & Root has hired as its toxicologist in this case?

A. No, I don't.

Q. Dr. Collie?

A. No, I don't.

Q. Did you know she testified she does not know the mechanism by which benzene causes or induces acute myelogenous leukemia?

A. I don't know that as a fact. That seems

reasonable.

Q. Do you know the mechanism by which alkylating agents, such as chemotherapeutic drugs, cause AML?

A. No.

Q. Since you don't know the mechanism by which benzene causes AML and you don't know the mechanism by which alkylating agents cause AML, it would be speculation on your part to say that they react or cause AML in the same way; correct?

A. On my part, if -- given that I'm not an expert, I probably shouldn't give such an opinion.

Q. And you will not be provided opinions on that at trial?

A. I will not. I will not.

Q. All right. You have not done any research in the epidemiological literature to -- along those issues, that you feel comfortable enough to express opinions with, that benzene acts the same way as

alkylating agents in inducing AML; is that correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I will not offer testimony on mechanisms of AML.

Q. (BY MR. BROWN) Are you familiar with the Zhang study, sir?

A. Yes.

Q. And with regard to the issue of whether benzene acts as an alkylating agent to induce AML in a similar way, what were Zhang's conclusions?

A. I don't know. I don't -- may I look at it?

Q. Yes, sir. I'll just quickly show them to you. This is what we've marked as Exhibit 9 to your deposition. On page 10, he says, "there is insufficient data to conclude that benzene induces specific structural changes in the patients with benzene-associated leukemia"; is that correct?

A. That's what it says, yes.

Q. All right. Over here, on page 36, it says, "leukemias associated with benzene exposure do not appear to have specific cytogenetic karyotype." Did I read correctly?

A. You did. That's from the same document.

Q. All right. What does that mean: They do not appear to have specific cytogenetic karyotype?

A. I understand that there's different cytologies associated with leukemias, AMLs, and characterized, I believe, Mr. Clark's was a 6-9 translocation, and this, referring to the characterization of the cell type.

MR. MARTINGANO: Number 6, number 9.

Q. (BY MR. BROWN) And what he's saying, Zhang is saying here, it says, "leukemias associated with benzene exposure do not appear to have a specific cytogenic karyotype"; correct?

A. That's what it says.

Q. Right. Do you know anything about cell types and that type of thing and what are related to benzene or what would be a fingerprint or biological marker to be able to say a benzene -- this is a benzene-induced AML as opposed to one that's not?

A. I looked at what the epidemiological literature could say with respect to this 6-9 translocation, and the epidemiology is silent on it, so I have no opinion.

Q. All right. Finally, Zhang says, in his conclusion, "At this point, however, there does not appear to be a unique pattern of benzene-induced chromosome abnormalities, as detected by either FISH or classic cytogenetics"; correct?

A. That's what it says. I can't tell you what it means.

Q. Is it your opinion that if somebody's going to have a AML that is related to benzene, there has to be a loss or deletion of any certain chromosome?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm not in a position to render an opinion on that. I imagine it's knowable, and if somebody were to comprehensively review the literature, might be able to formulate such an opinion.

Q. (BY MR. BROWN) All right. Well, let me object to responsiveness.

My question was, do you have an opinion, you yourself have an opinion that before one can opine that a AML is benzene-induced, there has to be a loss or deletion of any particular chromosome?

MR. MARTINGANO: Objection to form.

THE WITNESS: That's outside of my area of expertise.

Q. (BY MR. BROWN) All right. It's outside of the epidemiological research that you've done; correct?

A. It's a mechanistic question.

Q. Well, even though it's a mechanistic

question, sometimes stuff published -- studies are published based on the epidemiological gathering of information. And what I'm asking you is, have you done that research, epidemiologically, to form those opinions?

MR. MARTINGANO: Objection to form.

THE WITNESS: I believe I answered that, and I did do the research, and the epidemiological literature was silent with respect to this cytology.

Q. (BY MR. BROWN) All right. As you sit here today, would you say that before somebody can be diagnosed with AML as being a benzene-induced AML, they would have to have a loss or deletion of any particular chromosome?

MR. MARTINGANO: Objection to form.

THE WITNESS: It's outside of my area of expertise.

Q. (BY MR. BROWN) And you will not be offering those opinions at trial; correct?

A. That's correct.

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) The -- you say the epidemiological literature is silent. What epidemiological literature have you reviewed?

A. In epidemiology, we strive for specificity of exposure and specificity of disease, so we understand specific relationship between the two. Many studies -- and studies that didn't make this notebook -- may have only reported on hematopoietic cancers. It doesn't help us understand any

relationship with an AML. Within AML there's movement toward greater specificity, because we know it's a collection of diseases that probably have different etiologies, different causes.

The epidemiology is now evolving in this area, where the technology that allows us to separate the different cytogenetic types and groups can be compared on the basis of their risk factors.

A lot of that's being done for purposes of treatment, you know, what's -- what will be or might be an effective treatment for a specific subtype. But when I said the epidemiology is silent on it, there is no epidemiology that says that this specific translocation is associated with a specific risk factor or not, including benzene.

Q. Let me object to responsiveness.

What specific translocation are you referring to?

A. The 6-9.

Q. All right. Is there any epidemiologic literature that shows any other chromosome aberration of any other numbered chromosome, that you'd think is sufficient so that you could have a diagnosis of benzene-induced leukemia?

MR. MARTINGANO: Objection to form.

THE WITNESS: I haven't looked specifically at that, no.

Q. (BY MR. BROWN) Can you pull out a study of -- out of Exhibit 13 that says, before a leukemia can be related to benzene exposure, there has to be chromosomal damage to any particular chromosome?

MR. MARTINGANO: Objection to form.

THE WITNESS: I wouldn't expect that kind of statement in epidemiological studies. It's really an observational one. There may be some more recent studies, where that characterization is possible, but I'm not aware of one off the top of my head.

Q. (BY MR. BROWN) Well, let me object to responsiveness.

My question is, out of your book, notebook of studies that you brought with you and relied upon in forming your opinions in this case and we've marked as Exhibit 13, can you pull the study out of

that document and show us and the jury that before you can have a benzene-induced leukemia, you have to have a loss or deletion of any particular chromosome?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm not aware of such studies.

Q. (BY MR. BROWN) Would you agree that if

someone were to provide an opinion that before you can have an AML that's caused by exposure to benzene, that you would have to have some type of chromosomal -- chromosomal damage that, at least from the standpoint of epidemiological literature, that would be speculation?

MR. MARTINGANO: Objection to form.

THE WITNESS: Well, I think it's clear there has to be some genetic damage in order for a malignancy to result. Whether a specific transformation is necessary or not is not within my area of expertise.

Q. (BY MR. BROWN) Have you read any information from Dr. Estey, from M.D. Anderson?

A. I believe so, yes.

Q. What did you read from him?

A. I believe there was some... (Examining documents.) Unfortunately, this doesn't specify the --

MR. MARTINGANO: And just to speed things along, we didn't send anything from --

THE WITNESS: From the --

MR. MARTINGANO: -- Dr. Estey to --

MR. BROWN: Okay.

MR. MARTINGANO: -- Dr. Mundt.

Q. (BY MR. BROWN) Let me just read you this. And I don't know if I'm -- I want to make sure I cover it. I think this will do it. This is the deposition of Dr. Deborah Thomas, the physician who -- oncologist, the cancer specialist whose job it is to try to save this man's life.

She was asked this question in her deposition last week by Mr. Martingano: It says, "Dr. Estey has gone through some of the epidemiology associated with AML, and in that, he stated, he says, 'AML associated with benzene exposure, cytotoxic chemotherapy, are characterized by aberrations of chromosomes 5 or 7 or both.'" Did I read that correctly?

A. Yes.

Q. Had you seen that information anywhere in the literature you reviewed?

A. I believe so, yes.

Q. Do you agree that -- is it your opinion that

you have to have a chromosomal aberration of 5 or 7 or both before there can be a benzene-induced leukemia?

A. I think I've tried to tell you that I haven't examined that.

Q. All right. And --

A. So I can't say that there should be a particular cytologic -- cytotoxic -- I mean cytogenic change or not.

Q. Have --

A. It's something I have not researched.

Q. No one from Brown & Root or its lawyers asked you to look at; is that correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I was asked to review the materials in this case as they pertained to epidemiology.

Q. (BY MR. BROWN) Did any --

A. I looked at the epidemiology on the specific transformation in this case and didn't find there was an epidemiological direct link, or there was no epidemiological evidence.

Q. Of a direct link that, before you can say it's been benzene-induced AML, you have to have these deletions?

A. There was no evidence. I said earlier it was silent on this topic.

Q. All right. Do you know where Dr. Estey is getting -- at least as represented by Mr. Martingano -- these epidemiologic associations?

A. I don't know whether -- I don't know what

the sources are.

Q. All right. You haven't looked at those same sources, then, I take it?

A. It's possible. I didn't look at them for this reason. I'm not trying to elucidate the mechanisms.

Q. In any event, even after Mr. Martingano asked this question, her answer was: "Yes. But it's not exclusive. What that means is it's not exclusive, meaning that you can have AML that's related to a chemical exposure and not have those cytogenic abnormalities." Did I read that correctly?

A. Yes, you did.

Q. Do you agree with that?

MR. MARTINGANO: Objection.

THE WITNESS: It seems reasonable. Again, it's not my area of expertise. I have not evaluated that specifically, so I can't really comment on these things.

Q. (BY MR. BROWN) All right. Do you know Dr. Richard Irons?

A. No, sir.

Q. Never seen his work in the area of benzene and leukemia, Chinese studies that he's working on now?

A. I can check my list, but it doesn't ring a bell. You said it was in the Chinese section?

Q. Currently, he's -- it's my understanding he's doing some work over in China, benzene-related illnesses.

A. Unless he's further down on the author list of these, then I have not looked at his epidemiology work.

MR. MARTINGANO: Well, and, Darren, I don't even know if that's published yet.

MR. BROWN: Some of it is; some of it's not.

Q. (BY MR. BROWN) I'll represent to you I asked him this question in another case.

A. Excuse me. Asked who?

Q. Dr. Richard Irons.

A. Irons.

Q. He's a toxicologist that's often hired by defense companies and defense lawyers in this type of litigation and who, some would say, is the authority

on this issue, from the defendant standpoint.

A. He is a toxicologist, you said?

Q. He holds himself as a -- out as a toxicologist, yes. I asked him, "Is it your opinion, sir, that in order for there to be an AML that would be benzene-related, there would always be a loss or

deletion of chromosome 5 or 7?"

And his answer was what?

A. "No."

Q. "That doesn't have to be necessary. You don't have to see a loss or deletion of 5 or 7 in order for somebody to say this benzene -- this is a benzene AML, is benzene-related; correct?"

"That's correct. That's never been my opinion."

Did I read that correctly?

A. Yes, you did.

Q. Do you agree with that, sir?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have no basis to agree or disagree with you.

Q. (BY MR. BROWN) Okay. All right. You referenced the Pliofilm cohort in your study, on page 4. Do you see that? Or actually, I guess it would have been your sister who made that reference.

A. No. I represent and take responsibility for whatever is stated here, regardless of where it came from. Most of these are statements from the literature. So you might credit Infante or Rinsky.

Q. Do you recognize the Pliofilm study as -- and what would be -- let me just say it this way:

OSHA has referred to the Pliofilm study as an excellent study and definitive in nature, probably more so than any other study on benzene workers. Would you agree with that statement?

A. I agree it's relative.

Q. What do you mean, it's relative?

A. Relative to all that's available.

Q. Right.

A. It's the best that we have. Independently, we might not say that a study with seven individuals with a disease is a definitive study, today. I think, historically, it was the best that was available at the time.

Q. All right. It's the best we have even today, correct, with regard to benzene-exposed populations and ability to characterize their exposure and everything else, according to some; correct?

A. That's right. I think that they're --

Q. How about in your opinion: Is there any study that's better than the Pliofilm study in trying to determine whether -- what benzene illnesses are caused by exposure to benzene?

A. The advantage of this Pliofilm study is that there were actual measurements and efforts made to

quantify the exposures and to relate that to the risks of disease, so that comes closest, I think, to satisfying the definition of an epidemiological study.

Q. All right.

A. Unfortunately, we don't have those kinds of -- that kind of exposure information in other settings, where such exposures had occurred, but, fortunately, such exposures no longer occur.

Q. All right. Let me object to the nonresponsive portions of the answer.

I'm just trying to get your idea on what -- what do you feel about the quality of the Pliofilm cohort study?

MR. MARTINGANO: Objection, form.

THE WITNESS: It's relative. Given all that's available to us, epidemiologically, it's among the best we have.

Q. (BY MR. BROWN) All right. Can you think of

any that you would say is better?

A. No. We have -- I'm unaware of other studies where nearly no other substances were present and where there were reasonable estimates of these high exposures, these employees were exposed.

Q. All right. What are your opinions, sir,

with regard to the latency of the development of AML from exposures to benzene?

A. Well, as I represented in the report, there were four AMLs cases in the first study, and their average was 16 years. It's difficult to estimate that latency from these studies, because they used mortality as the endpoint rather than the incidence of the disease. And because AMLs may not be rapidly and universally fatal, a lot of time is added to that estimation. So we don't really know what the latency is.

We do know, from other risk factors, like radiation and chemotherapy, that the latencies are relatively short relative to cancers of other tissues that produce solid tumors.

Q. Well, let me object to responsiveness.

My question was, what is your opinion with regard to the latency period that is required between onset of AML and exposure to the disease? Do you

have any opinion --

A. That makes no sense. I'm sorry. I think you misspoke.

Q. Well, let me ask --

A. Onset of AML and the exposure to the disease?

Q. Let me ask you, what are your opinions, sir, with regard to minimal, maximum, average latencies between the -- the time period that exists between exposure to benzene and the onset of AML?

A. Thank you. That's rendered here as well. There are frequent references in the literature that it's in the vicinity of five to 15 years, and it may be --

Q. Where are you getting that in the literature?

A. Well, first of all, represented that the -- in the Pliofilm cohort itself, which is based on mortality, not incidence. There is a range from -- actually, some of the individuals were not exposed in this cohort, so I don't know how to estimate their latency when they were not exposed. But those that were, the average was 16, and the maximum was 21 until death. So from that, you could say, let's be conservative and say, well, maybe that that was

sudden onset and rapid death; the maximum would be 21.

From other exposures -- and the way I have to formulate an opinion on this, because of the lack of good, direct evidence of latency, is by applying what is the latency when there are other carcinogens,

like ionizing radiation or the chemotherapeutic agents. And in those cases, they might be as low as one or two or three years.

And so I look at it and say, reasonably and conservatively, maybe it's five to 15, allowing for some that are shorter and some that are longer.

Q. Well, let me object to the nonresponsive portions of the answer with regard to latencies of any agent other than benzene, because the question was only related to benzene.

Now I'll ask you, sir: You don't have any evidence or any studies that support the proposition that a latency that results -- that an exposure to ionizing radiation that results in AML and its latency period is similar to the latency period that is -- results from exposure to benzene, that results in AML; correct?

A. I disagree. I think that we might agree that the mechanism by which those malignancies are

initiated could be quite different. But because we don't have any other evidence, it's reasonable to use these conditions, once induced, to determine a reasonable latency.

Q. All right. Again, I need to object to responsiveness.

Do you know the mechanism by which radiation causes AML?

A. No. I've answered that. I think -- I'm not -- well, my answer is, I'm not addressing any mechanistic stuff.

Q. Okay.

A. Given that it's induced, we can then epidemiologically observe what the latency is.

Q. And -- but do -- you would assume -- or I think you have assumed and told us that their mechanism may be different, between radiation and benzene; correct?

A. It's likely different.

Q. And because they're likely different, then it's likely that they could have a different latency period; correct?

A. I'd say it's possible that they could have a different latency.

Q. But the bottom line is, you don't know if

it's possible or impossible or probable or whatever, because that's not your area of expertise; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm sorry. Determining latencies is specifically an epidemiological phenomenon.

Q. (BY MR. BROWN) Well, let me object to the responsiveness.

My question was relating to mechanisms of latencies caused by one toxic agent as equating to latencies caused by benzene.

A. I've never commented on specific mechanisms, and I've told you repeatedly that I don't intend to comment on specific mechanisms. But given that a cancer is induced, the latency can be observed. And it's reasonable to equate these in -- lacking other information.

Q. Where are your studies that says it's reasonable to equate a latency from a radiation-induced leukemia to a latency from a benzene-induced leukemia?

A. That's my professional opinion as an epidemiologist.

Q. That --

A. We equate, we find latencies for other

cancers, that have -- likely to have different mechanisms -- have overlapping or reasonably, you know, ballpark type latencies.

Q. Well, let me object to responsiveness.

You say that's your opinion. I asked you, where are your studies that support that opinion? Do

you have any with you?

A. I don't know that there is a study that compares latencies --

Q. So --

A. -- based on different mechanisms of induction.

Q. So this idea or hypothesis that you have, that it's reasonable to compare latencies from a radiation-induced AML to a benzene-induced AML is generally what you say; correct?

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) That's your own opinion, and there's -- it's not based on any studies that you're able to show us today; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have really have no idea what your question was. It was a bit convoluted.

What we know from looking at latencies, for known risk factors and benzene -- I mean known

risk factors in AML, is they're all around the same. There's no reason to believe that because a mechanism might be different, that this is a mere coincidence. They are all typically much shorter than that of solid tumors. And we do the same thing there. It's just --

Q. (BY MR. BROWN) Let me object as to responsiveness, again.

Aside from your opinion and what your personal belief is, can you offer us any peer-reviewed, scientific, empirical data that shows that latencies from radiation-induced leukemia is the same as benzene-induced leukemias?

A. I'm not aware of such information, nor have I looked for it.

Q. Do you have any peer-reviewed, scientific, empirical data upon which you base your opinion that they're the same?

MR. MARTINGANO: Objection to form.

THE WITNESS: Let's say I've described the method by which I've arrived at that conclusion. Whether I can point today to those specific papers, I'll say no, I can't. But I will, and I believe that if you ask if I were -- would have it contained in here, all opinions, that may be

an area worth looking into further, comparability of the latencies.

Q. (BY MR. BROWN) I object to the responsiveness.

The Pliofilm study, you've stated that there was an average of 16 years, but that's not really how

latencies go. Really, it's more like a distribution occurred; correct? Some period -- people develop AMLs in a shorter period, after exposure to benzene, than others; correct?

A. Yes. And average is usually the summary measure we use for distributions.

Q. If you'll look at Exhibit 6, you know, you said in your report that the longest period was 21 years. I'm looking at table 4 of the benzene and leukemia and epidemiological risk assessment published April 23rd of '87 in the New England Journal of Medicine, and it shows the latency period of -- for one AML at 37 years. Do you see that?

A. Yes.

Q. Can you explain why your report only has 21 years as the longest?

A. This is a different report. This is Rinsky's, with follow-up. And because they have used mortality, you're going to expect much longer

latencies. This is not really what we talked about, or as you even defined as latency, which was the first possible exposure to the onset of the disease.

Q. What is your definition of latency?

A. I just said it: It's from the -- that's -- maximum latency is from the first possible

exposure -- let's assume the first day on the job, somebody was exposed -- to the onset of the disease. Had that exposure that gave rise to the disease occurred any time later, the actual latency is going to be shorter.

So, on average, the maximum latency, in this cohort, using mortality, in the first report, of '77, was 16 years.

If you keep following that group as long as some of them survive, the latency will change. It's not a concrete; it's a relative phenomena. So if these same people -- well, they died. If you have other cases that survive, then how can you calculate their latency 'til death? It gets longer and longer. It's just a technical --

Q. Well, let me object to the responsiveness.

My question is, what is your definition of latency?

A. I've given it. It's from the point of first

exposure to the diagnosis of the disease.

Q. All right. Then why did somebody write in your report, "It should be noted that the author's interpretation of latency, as the time from first exposure to death, is not typical"?

A. That's correct.

Q. All right.

A. That makes it impossible to interpret, and it makes it difficult to ask your earlier question -- answer your --

Q. All right. But this is the same study which you were saying was, relatively speaking, the best study that we have on benzene-exposed populations; correct?

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) Is that correct?

A. Right, right. And I said that latencies are going to all be overestimated because of the way they did it. It's not typical. It's what you read from my report.

Q. And then, here again in the 2002 follow-up of the same cohort, we have latencies of 45 years, 27 years, 40 years, 58 years, and then the last myeloid leukemia, 51 years. Do you see that?

A. Again, as they've defined it, that's what

you'd expect. It doesn't help us understand the latency as I define it and as the field intends to use it.

MR. MARTINGANO: What exhibit is that, Darren?

MR. BROWN: That's Exhibit 7. I'm sorry.

Q. (BY MR. BROWN) And are you familiar with the Hayes study --

A. Yes.

Q. -- which finds latencies as far as 40 years between initial exposure and onset of disease?

A. Correct.

Q. Any reason to dispute that?

A. Keep in mind that -- what latency means. I have no reason to dispute what they've observed. Whether you can interpret that as a representation of the average time from first adequate exposure to an agent and the onset of disease is in there somewhere, so --

Q. Well, what would you consider Mr. Clark's latency period to be, if you assumed he had benzene exposure, as he and his coworkers testified?

A. Well, let's assume, as he testified, he was exposed heavily between '72 and '77. I believe that's a correct representation of his testimony.

Then we might allow, because of this -- his exposure, by the way, as represented by Mr. Martonik, is many times that of the platform workers.

And so one would expect relatively short latency, because latency is also a function of the intensity of the exposure. From first exposure --

from first exposure to the exposure that might have given rise to the disease comes much more quickly if you're exposed every day than if your first exposure isn't repeated for another year or two. So that's another dimension of latency that's largely underrepresented.

So from '72, '80, '90, '02, he's already, by '02, more than 30 years out from the first heavy exposure, I think was -- he was diagnosed in '05, '06. So we're getting up to 35 years for a high exposure group that seems to me to fall outside of that distribution of latencies from exposure to onset of disease.

Q. All right. Let me object to the responsiveness.

It doesn't fall outside the distribution of the distribution curve from the Hayes study, does it?

A. I -- it appears not. I'd have to look at Hayes and how that was calculated and how reliable

the evidence of first exposure was.

Q. Did you look at the Shell study, the Wood River study, or the Deer Park study?

A. Yes.

Q. Did you notice that one of their latencies was 47 years?

A. Well, and keep in mind that if you interpret a latency, first of all, it's a maximum latency. We don't know at which point in time an exposure occurred that gave rise to that disease in any individual. We do know that for, say, atomic bomb survivors. We do know that for the clinical administration of chemotherapeutic agents. Those are probably closer to true latencies.

But with an individual, you look back and say, 40 years ago he started on a job where he might have used benzene, and now he's got the disease. Well, you could say, if that disease were caused by benzene, the latency is within that; this is the maximum.

On the other hand, there are, what, 14,000 people a year in this country that contract this disease. Some of them are going to have had occupational exposures to benzene, that had nothing to do with their disease. Their latency could be one

week. It could be a hundred years.

So I think that there's too much interpretation or, let's say, not a full interpretation of latency going on here. And when you factor these things together, it points back to relatively short latency, and that 35 years, 45 years

is not consistent with the data.

Q. Let me object to responsiveness.

Sir, is it your testimony that it is impossible for somebody to have exposures to benzene and not develop AML until 34 years later?

A. I think that it's -- I can't say concretely that it's impossible. In epidemiology we deal with probability. I think that the longer the time period from exposure, the more improbable that that disease was induced by that agent.

Q. We've just looked at three different studies, the Pliofilm study, the Hayes study, and the Shell River study, where I've pointed out specific examples of people who were in those studies, that had longer latencies than Mr. Clark. You understand that?

A. That's a fact.

Q. And --

A. As they've defined -- as the authors have

defined latency in their studies.

Q. All right. And those people are in the studies, with longer latencies than Mr. Clark. Are you going to say that those people's AMLs or leukemias were not related to their exposures to benzene?

MR. MARTINGANO: Objection to form.

THE WITNESS: That's an equally good interpretation as the one you would prefer, that they were induced by that benzene exposure --

Q. (BY MR. BROWN) You --

A. -- on the first day that they were exposed.

Q. You can't say which one is more likely or not?

A. Well, that's why, epidemiologically, we don't look at one individual. I could say, in Pliofilm, there's someone with no exposure. Why don't we pick that one.

Q. That's all --

A. Mr. Clark's disease should have occurred by the end of '77, or it wasn't related to benzene. But on distribution, we've got cases -- not a lot. We don't have a lot of cases of benzene-induced AML to study. We have teens, I think, in maximum.

So -- but based on that distribution, we

know we can't look at it from the Pliofilm because we don't know when they got the disease. They don't report that. That could be reported. We should ask Dr. Infante about that. That would be a helpful contribution to the science of this topic. So we look at other areas. The whole idea of latency is

complicated.

Q. Let me object to responsiveness.

It's complicated, and it doesn't take into consideration things like individual susceptibility; correct?

A. It reflects individual susceptibility. That's why, even with an infectious agent, you get hepatitis A exposure. Some 50 days later, on average, people will get sick who will -- who are going to get sick. Among the susceptibles, there's a small distribution of time over which they get the disease.

With chemical agents, you have to be able to identify the point at which an exposure occurred that induced the disease. We can't do that.

Q. And isn't it fair to state there's no bright line number for the latency period for a -- such that you could opine or not opine that a benzene resulted in leukemia?

A. Epidemiologically, we look at numbers and patterns. And based on those numbers and patterns, we draw conclusions: based on the cases that have occurred, that are believed to be caused by benzene; the distribution points to a shorter latency than would be possible for Mr. Clark. There are

exceptions that -- in individuals, but in epidemiology we're talking about averages and tendencies and patterns. Probabilities. There's a much greater probability that his exposure period falls outside of normal latency for benzene.

Q. Okay. It falls outside of normal latency doesn't mean that it's impossible his leukemia is related to exposure to benzene; correct?

A. I think that's fair. I think I'm only asked if it's more likely than not, and that's where I'm coming from.

Q. All right. Then you mentioned that -- okay. We need to take a break.

MR. MARTINGANO: A break? Let's go off the record.

THE VIDEOGRAPHER: The time is 1:29 p.m. We are going off the record.

(A recess was taken.)

THE VIDEOGRAPHER: The time is 1:37 p.m. We

are back on, on record.

Q. (BY MR. BROWN) All right. We left off talking about latency. Sir, what studies do you have that would say that the length of a latency period is directly related to the intensity of the exposure to benzene?

A. The concept of latency, broadly, derives from studies that look at intensity in latencies. You have to study situations where the exposure is known to have caused the outcome. In such settings, it is not benzene. You tend to have a relationship -- say asbestos, where asbestos exposure is intense. The diseases that follow, like mesothelioma, typically have long, long latencies, but they're shortest when the intensity is high and they're longest when the exposure is low. It's part of the concept.

Q. All right. Let me object to responsiveness.

My question was, what studies do you have, have here with you in your Exhibit 13, in your studies book, that prove that latency duration or the length of a latency period is directly related to the intensity of the exposure? And --

A. I told you it's not possible with the benzene literature.

Q. So, again, there's nothing that you rely upon in the benzene literature that supports that opinion, other than your own opinion; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: My scientific opinion, based on broad application of this concept, is that

this is generally true, and is expected to be true in this setting as well.

Q. (BY MR. BROWN) Have you ever heard of the Latin phrase ipse dixit? Am I pronouncing that right?

MR. MARTINGANO: No. But I don't want to hear it either.

MR. BROWN: Yeah. Whatever.

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) The one that says "because I say so, it is." Is there anything other than because you say so that we can look to as peer-reviewed, empirical data that supports what your opinion is, that the length of a latency period is directly related to intensity when it comes to benzene exposure?

A. For benzene, no.

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) All right. Some more

comments about your report. On page 4, you talk about studies from refineries. Then it goes over to page 5. And 6, and then your conclusion paragraph says, "Overall, most of the petroleum industry studies, representing tens of thousands of workers, demonstrate no excess of AML risk"; is that correct?

A. You've read it correctly.

Q. Is that your opinion, sir?

A. Yes.

Q. Here again, in the preamble to the benzene standard, it's commented that Dr. David Savitz -- do you know him?

A. I do.

Q. You recognize him as a competent, capable epidemiologist?

A. Yes, sir.

Q. Updated a previous review of the literature, Savitz and Moure, to include studies reported through 1985. Regarding the studies of refinery workers, he concluded that several studies showed notably elevated rates of mortality from lymphatic and hematopoietic cancers convincingly linked to benzene exposure. In the hearing testimony, he summarized these findings, and this is what he said: "A number of these studies of all refinery workers have

indicated that increased risk of lymphatic and hematopoietic cancers. The studies are [sic] most convincing for excess risk are, Roushton" --

A. Rushton.

Q. -- "Rushton and Alderson's case control study indicating risk ratios of 2 to 2.3 for benzene

exposure among refinery workers with leukemia." Did I read that correctly?

A. Yes. I think so. I can't see that far away, but it sounds good.

Q. Okay. Down here it says, "The complexity of the refinery environment leaves open the product" -- "the possibility," rather, "that some other solvent or refinery product is also a leukemogen, but no other agent has the degree of laboratory or epidemiologic data which exists for benzene to support this possibility." Do you agree with those statements, sir?

A. Those are fair statements, sure.

Q. That's contradicting what this summary paragraph is in your report.

MR. MARTINGANO: Objection.

Q. (BY MR. BROWN) Do you agree that?

MR. MARTINGANO: Objection to form.

THE WITNESS: No, I don't agree with that.

You only read the first sentence of that paragraph.

Q. (BY MR. BROWN) Well, okay. The document speaks for itself. Did I read it correctly?

A. No. You read it incompletely.

Q. What paragraph are you talking about?

A. These --

Q. In your report?

MR. MARTINGANO: Page 6.

THE WITNESS: You asked me if you read from my report correctly or from that report correctly?

Q. (BY MR. BROWN) I'm just saying, you agree with what Dr. Savitz said; correct?

A. I did agree with that, and you said it contradicted my report.

Q. I said it contradicts this conclusion paragraph right before chemical industries and other workers.

A. And I said I disagreed with that statement, because you had represented this paragraph by its first sentence.

The next sentence, "In studies where excess cases are noted, whether statistically significant or not, the number of excess cases is very small. There

remains the possibility that some of these cases had been exposed to very high levels of benzene, that were not individually documented, were exposed to radiation, reflect normal, random variation," and so on.

Q. Okay. So you're saying this first sentence

of your conclusion, under refinery workers, is true, and also what Mr. Savitz says is true?

A. Overall, most of the studies don't show an excess, but some do. He identifies a couple of studies where there is an excess. And I agree that there are studies with an excess, and they could well have been caused by benzene. They could also have been caused by other things, because these kinds of studies can only represent whether there's an excess, not what is the cause of the excess.

Q. Well, he --

A. The case control study is a stronger -- has a stronger opportunity of looking at other risk factors.

The second part that you read suggests there could be a number of agents in most of these workplaces.

Q. There are refinery studies that show significant elevated risk of leukemias among benzene-

exposed workers; correct?

A. Correct.

Q. They are reliable, quality epidemiological studies; correct?

A. Mostly.

Q. And there are chemical industry worker

studies which show statistically significant elevated increased risk of AML; correct?

A. (Examining document.) There might be. There were four in this study of 35,000, at a borderline, statistical significant results. So yes, you might find some results.

Q. Did you report any of the ones that -- in the refinery section or the chemical section, that show those excess risk? Risks, rather.

A. Well, there's quite a few in the refinery section. Let me see the... Even the Rushton has failed to show excess AML -- oh, I meant to point out, too, that though you read that correctly, it does say "leukemia," not necessarily AML. You'll find the language in my report is specific to AML, as is more -- most relevant to the case in hand.

Q. Well, I mean, it all boils down to this idea that benzene is known to cause AML. You don't disagree with that?

A. I don't disagree with that.

Q. You would agree that the greater weight and overwhelming evidence supports the connection between exposure to benzene and development of AML; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Greater than...

Q. (BY MR. BROWN) The greater weight --

A. ...other types of -- I mean, I don't understand how you...

Q. Well, when you testified in your deposition last time, you were testifying in a CLL case, and you were saying you won't rely upon one or two studies; you want to look at all of the studies and have a quality --

A. Right.

Q. -- of what's the weight of the evidence.

When it comes to the weight of evidence between exposure to benzene and AML, the weight suggests there is a strong association; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Correct, given adequately high concentration of exposure.

Q. (BY MR. BROWN) All right. And when you say "high concentrations of exposure," what do you mean?

A. For most of the petroleum workers, they're

exposed to very low levels, often a matter below exposure limits, and in those populations, we don't see excesses of AMLs.

Q. Let me object to responsiveness.

My question was, when you say benzene can induce AML at high exposure levels to benzene, what

are you referring to? What's a high exposure level --

A. Uh-huh.

Q. -- that you're referring to in that?

A. I'm sorry. It's admittedly subjective. It's been attempted, in a number of risk assessments, to determine the point at which the risk curve increases. There's risk assessments that identify a cumulative exposure of 200 parts per million years and 400 parts per million years. I think they're referenced here. I had to consider those high levels, although they don't tell you what the intensity was. You could have one part per million for 200 years, or you could have 200 parts per million for one year. And that's the same message. I don't think those confer the same risk, so it's not -- sorry. Not to be obtuse about this, but it's -- it's not so clear.

The high levels, the Pliofilm workers were

exposed to tens, to hundreds of parts per million. And clearly, they generated an excess of leukemias in general, and AMLs as well.

Q. All right. Well, let me object to responsiveness.

In the Pliofilm study, at what levels did it

start to bear out that workers were developing leukemia from exposures to benzene, on the exposure matrix that they used in that case?

A. Well, I believe I referred to the risk assessments based on those data. The studies themselves can't tell you what level. That has to be statistically modeled. And...

Q. Well, here. Looking at Exhibit 6, you can see that with stratification, according to the levels of cumulative exposure, workers exposed between 40 and 199 parts per million had a relative risk of 300 -- 322?

A. Yes, yes. See, those are adequately high. This is Rinsky's, yes.

Q. And as he goes up to the higher category, 200 to 400, it's even higher. And as it -- that's what they referred to as the dose-response curve; correct?

A. I believe that they depict that curve in

this or maybe another... I think this is one of several risk assessments.

Q. And you're referring to --

A. And they consistently show that these cumulative exposures are in the hundreds of parts per million.

Q. And this is what you've told us as far as epidemiological studies go: Relatively speaking, it's the best we've got; correct?

A. It's the only one that allows the quantification of the risk.

Q. All right. Were you aware that Brown & Root's own industrial hygienist in this case, Mr. Schumacher, had calculated a cumulative year exposure for Mr. Clark, had he been exposed to benzene, like Mr. Clark and his coworkers said he was?

MR. MARTINGANO: Objection to form.

THE WITNESS: No. I'm not aware of that.

Q. (BY MR. BROWN) I'll represent to you that he's calculated that exposure at 230 part per million years or more, all right?

A. Yes.

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) With that kind of exposure,

if you assume that Mr. Clark did have that kind of exposure, like Mr. Schumacher calculated, would that be sufficient in terms of epidemiological literature that you reviewed, to be associated with causing AML?

MR. MARTINGANO: Objection to form.

THE WITNESS: I think that with the caveat

you stated -- had that exposure actually occurred -- then that certainly would put Mr. Clark and individuals similarly exposed at increased risk.

Q. (BY MR. BROWN) All right. If Mr. Clark was exposed to benzene, like he and his coworkers say he was, would you agree that, in all probability, his AML is as a result of his benzene exposure?

MR. MARTINGANO: Objection to form.

THE WITNESS: I think I would have an easier time coming to that conclusion, had there been credible evidence of the use and exposure to benzene and an appropriate latent period. So if we can add to your hypothetical that the disease developed within 20 years of that time, it would be -- it might lean me in that direction, yes.

Q. (BY MR. BROWN) Of all the risk factors that there are for AML, which ones did Mr. Clark have, according to his testimony and the evidence that

you've seen?

MR. MARTINGANO: Objection to form.

THE WITNESS: I don't think that's an entirely fair question, because there are very few known risk factors for AML. Most cases are idiopathic, for which there's no known cause.

So the probability that anyone who develops the disease has a risk factor, like an x-ray or radiation exposure, is quite high. Whether that had any role in the disease is unknowable.

So your question implied, Of the risk factors that are known, which did he most likely have? Well, most risk factors are not known. We can't predict. We can't explain the vast majority of AMLs that occur.

Q. (BY MR. BROWN) All right. Let me object to responsiveness.

Do you have any evidence that Mr. Clark was exposed to radiation in sufficient quantities to cause his AML?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have seen no evidence that Mr. Clark was exposed to -- convincingly, to any of the known risk factors. And if most disease occurrences are unexplained or idiopathic, then

it's highly probable that he is among them.

Q. (BY MR. BROWN) All right. Let me object to responsiveness.

That's why we're going to be -- end up taking longer today, unless you all just walk out on me.

Have you seen any evidence that Mr. Clark was exposed to radiation in sufficient quantities to cause his AML?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have not seen his radiation exposure history.

Q. (BY MR. BROWN) All right. And you have not -- so the answer to my question is no, you have not seen any evidence that he was exposed to radiation in sufficient quantities to cause his AML; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: That's correct.

Q. (BY MR. BROWN) Have you asked for his radiation exposure history?

A. No, I have not.

Q. Have you felt that was necessary that you have that in order to express your opinions in this case?

MR. MARTINGANO: Objection to form.

THE WITNESS: No. My goal was to observe, to evaluate what was provided with respect to benzene and his disease, not to explore what might have caused his disease.

Q. (BY MR. BROWN) Object to everything after no

as nonresponsive.

Have you seen any evidence in this case that Mr. Clark was exposed to chemotherapeutic drugs or alkylating agents, sufficient quantities to cause his AML?

A. I believe he was not, from the medical record.

Q. Have you seen any evidence that he was exposed to arsenic in sufficient quantities to cause his acute myelogenous leukemia?

A. I'm not sure that I would recognize arsenic as a cause of -- or anything else that we haven't mentioned yet as a cause.

Q. All right. Let me ask you that question, then: Do you recognize arsenic exposure as a risk factor for AML?

A. No, I don't. I have not looked at that specifically.

Q. Have you seen anything about Mr. Clark's

family history that you would say is a contributing cause to his AML?

A. I'm not sure that -- of what elements of a family history are known to be risk factors for AML. I have not seen anything.

Q. So the answer to my question is no; correct?

A. Correct.

Q. Have you seen any chromosomal aberrations or abnormalities that Mr. Clark has, that you believe were a risk factor of his AML?

A. I'm not familiar with his profile, nor am I -- is that my area of expertise.

Q. All right. And then we've talked about his smoking, and you cannot say that his smoking was such that it put me him at an increased risk of his AML; correct?

A. Correct.

Q. So the only risk factor that we know of, environmental agent, is benzene; correct?

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) I understand your position, that you don't believe what the guys say, Mr. Clark and his coworkers. But if you assume what they say is true, then wouldn't it be a fair assumption and reasonable scientific probability that benzene was a

contributing factor of his AML?

MR. MARTINGANO: Objection to form.

THE WITNESS: With the previous caveat that I gave you, that also, within a reasonable time frame following that exposure.

Q. (BY MR. BROWN) All right. What evidence --

what would you tell the jury in this case if the jury were to believe -- well, strike that.

Well, let me just ask you, what are your opinions in this case? Can you just list them one, two, three, in that kind of order?

MR. MARTINGANO: Objection to form. That's what the report kind of --

THE WITNESS: Sure.

Q. (BY MR. BROWN) Well, I mean, what are your opinions as to the cause of Mr. Clark's disease?

A. My opinion is that --

MR. MARTINGANO: Objection to form.

THE WITNESS: -- that it can't be determined what his cause was. And therefore, my conclusion -- one of my conclusions is that it's more likely than not an idiopathic disease.

Q. (BY MR. BROWN) All right. If you assume that he was exposed like he and his coworkers testified, would that be an assumption that would

allow you to determine a potential cause of his disease?

MR. MARTINGANO: Objection to form.

THE WITNESS: I think I've answered this, and I have caveats to that, so we'll prolong the debate if you don't embrace those, or we can

assume that they hold.

The exposure has to be substantial to benzene. It's clear from the literature.

Q. (BY MR. BROWN) 230 parts per million years is substantial, isn't it, sir?

MR. MARTINGANO: Objection to form.

THE WITNESS: If it were obtained over the short period of time that he claims to be exposed, it qualifies for high exposure.

Q. (BY MR. BROWN) Well, 230 parts per million years is high exposure, no matter how long he was exposed; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Theoretically, if you lived a thousand years, it would be a modest exposure on a daily basis. That's all I'm saying, is, over a five-year period, 230 part per million years, cumulative, means that that's quite high.

Q. (BY MR. BROWN) And if he had those exposures

to benzene, like he and his coworkers testified, could you rule out benzene as a cause of his AML?

A. Not exactly. Give -- you're saying, still assuming this 35-year latency?

Q. Well, I'm saying if Mr. Clark had exposures to benzene, like he and his coworkers testified he

did, could you, as an epidemiologist for Brown & Root, rule out benzene as a contributing factor to his AML?

MR. MARTINGANO: Objection to form.

THE WITNESS: No, no.

Q. (BY MR. BROWN) All right. And so, really, the only way you can say that you don't believe his AML could have resulted from exposure to benzene is to say, "I don't believe that these workers were correct when they say they were exposed to benzene"?

MR. MARTINGANO: Objection to form.

Q. (BY MR. BROWN) That's really the basis of your opinion, isn't it, sir?

MR. MARTINGANO: Objection to form.

THE WITNESS: My understanding is the science suggests that a high level of benzene exposure is required to induce benzene-related leukemia. Given a case of leukemia that was exposed, that is one interpretation and a more

probable one.

If he wasn't exposed to that, to benzene, then the other explanations are more probable, like it's idiopathic.

So these are things that, based on the evidence made available, we then formulate a

professional opinion.

Q. (BY MR. BROWN) So, I mean, that's what it boils down to: As an epidemiologist, if he wasn't exposed to benzene, then your opinion would be his AML is idiopathic; correct?

A. Yes, exposed to benzene at the high concentrations that he claims, whether or not --

Q. Right.

A. -- the modeling of his exposures was accurate.

Q. But if he was exposed to benzene, like he said he was, then, in all probability, benzene was a contributing factor of the development of his disease; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: Not in all probability.

Q. (BY MR. BROWN) Well --

A. You're pushing it a little bit.

Q. In probability, then?

A. It becomes a more likely explanation. It can't be known, but it's more reasonable.

Q. Well --

A. If it further fits within the time frame, then the greater probability can be assessed to that.

Q. May I ask you if, in the documents that you

received from Brown & Root's lawyers, you saw what was -- has been previously marked Exhibit 12 to another deposition?

MR. MARTINGANO: And I'll -- let me just stipulate we did not -- that's not a document that's been produced in this case. That's a document that the plaintiffs have obtained from other sources.

MR. BROWN: Okay. Let's go ahead and just mark that as Exhibit Number 15 in this case, so we won't get confused.

(Plaintiff's Deposition Exhibit No. 15 offered and marked.)

Q. (BY MR. BROWN) All right. I've marked the Brown & Root document as Exhibit 15. Have you seen that before, sir?

A. I'd have to compare it with the stacks of documents that I have on this.

Q. Well, let's take --

A. But do you represent that this --

MR. MARTINGANO: I'll --

MR. BROWN: Let's take Mr. Martingano's word for it.

THE WITNESS: -- was not sent to me? So, no, I have not seen it.

Q. (BY MR. BROWN) Okay. Let me refer you to a couple of things in there. First of all, you can see it's dated June 1, 1963; correct?

A. Correct.

Q. And here on the foreword it mentions, "Safety bulletins and pamphlets published by the National Safety Council, in expressing a variety of safety themes, are also available to each job on an as-required basis"; correct?

A. Yes. I think that's right.

Q. So they had available to them National Safety Council data; right? According to that document.

A. According to that document.

Q. Have you ever seen the 1950 National Safety Council document on benzol, that we've marked as Exhibit 11 for today, sir?

A. I don't recall having seen this, no.

Q. All right. That document is dated 1950 at

the bottom; correct?

A. That's correct.

Q. And it's published by the National Safety Council; correct?

A. Correct.

Q. In paragraph 6, in the middle column down,

about halfway, do you see where the sentence starts, "Inasmuch"?

A. (Examining document.)

Q. No, no, no. Let's see.

A. I thought you were --

Q. Right here.

A. I though you had memorized it.

Q. "Because the appearance and pleasant smell of benzene give no warning of its toxic effect and because a victim may become incurably poisoned before he feels ill, benzene is one of the most insidious poisons ever to find wide industrial use."

Did I read that correctly?

MR. MARTINGANO: Objection to form.

THE WITNESS: (Examining document.) Yes, you did.

Q. (BY MR. BROWN) All right. And there are numerous other portions of that document that discuss how to protect workers from the benzene hazards in

various jobs.

The point is, if Brown & Root was members of the National Safety Council in '63 and was receiving information from the National Safety Council and referencing it in their publications, like we have as Exhibit 15, can you think of any good reason why that

information that's in that National Safety Council document shouldn't have been communicated to the Brown & Root employees out there, on the job?

MR. MARTINGANO: Objection to form.

THE WITNESS: I see no reason why -- not to provide this information to people who are handling benzene.

Q. (BY MR. BROWN) Workers have a right to know about the health hazards of the chemicals they're required to work with; correct?

A. This -- yes, they do. This clearly emphasizes the extreme flammability and harmful vapor.

Q. Well, sir, is it your testimony that workers in the maritime industry or the petroleum chemical industry never used flammable solvents as a cleaner or to dissolve all their grease?

MR. MARTINGANO: Objection to form.

THE WITNESS: It's déjà vu. Certainly

solvents are used and they are flammable and have flash points at different levels. Benzene has such a low flash point that, for solvent use, is very hazardous, for explosive reasons alone.

Q. (BY MR. BROWN) Well, do you know to the extent benzene was used in the petrochemical

industries by workers as a cleaning solvent throughout the 1950s and '60s and '70s?

MR. MARTINGANO: Objection to form.

THE WITNESS: I have not seen industrial hygiene reports regarding how or by whom it was used. I have heard anecdotal stories of benzene being used, including references to benzene for whatever solvent was present.

Q. (BY MR. BROWN) You've read --

A. There is a general folklore about solvents that -- people refer to it various ways. And so from a -- say, a scientific perspective or a documentation of an industrial hygiene or actual process use, that's less frequently produced.

Q. Have you read epidemiological studies, such as the Shell, Deer Park, and Wood River studies, that reference the fact that benzene was used as a cleaning solvent among workers in their plants?

MR. MARTINGANO: Objection to form.

THE WITNESS: I clearly agree that benzene would have been used as a cleaning solvent in certain circumstances.

Q. (BY MR. BROWN) And it's flammable in the 1950s, it's flammable in the 60's, it's flammable in the '70's, it's flammable if it's used in Shell, and

it's flammable if it's used out on the open seas; correct?

A. I never questioned its flammability.

Q. Well, it's -- but you are questioning its use as a cleaning solvent because it's flammable, knowing all along that it -- that was commonly used as a cleaning solvent in that industry; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I really didn't say that because it was used somewhere else in the industry, that it was used in this -- on these barges, around welding operations, or that it was used to clean welding equipment. Solvents were used, and there are various solvents available. What was used in a specific place, especially on these barges, remains unknown, because we don't have any good evidence of what was used.

Q. (BY MR. BROWN) Except for the guys' own testimony; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: There's testimony as to what they believed the substance they were using, one of the substances was, another of which was diesel. Another was, I think, trichloroethylene.

Q. (BY MR. BROWN) What do you think the

substance was that they were using, sir?

MR. MARTINGANO: Objection.

Q. (BY MR. BROWN) Besides benzene?

A. Well, I have no basis to know but for what's been testified to. There was a suggestion of a rig wash substance. That's another part of testimony.

Q. Do you know what the chemical content was of rig wash?

A. No, I don't.

Q. I think you mentioned naphtha earlier. Do you know if naphtha is a product that contains benzene?

MR. MARTINGANO: Objection to form.

THE WITNESS: I don't know what -- I think naphtha can certainly have benzene contamination.

Q. (BY MR. BROWN) Were you aware that in 1969 the API studied the toxicological effects of naphthas, and in that study they found that naphthas containing as little as 1 to 2 percent benzene by

volume could result in benzene levels in air that exceeded the TLV for that time of 20 parts per million?

MR. MARTINGANO: Objection to form.

THE WITNESS: I haven't looked at that.

Q. (BY MR. BROWN) Would you consider a air

concentration of benzene, of 20 parts per million, to be unsafe?

MR. MARTINGANO: Objection to form.

THE WITNESS: Well, I certainly don't know the circumstances under which that was detected or measured. Twenty parts per million as ambient constituent is certainly high and well above current exposure limit.

Q. (BY MR. BROWN) Give me one second. I'm about -- I think I'm going to be able to wrap up. Why don't we take a quick break --

MR. MARTINGANO: Yeah. Let's go off the record.

MR. BROWN: -- and I'll see where we might be able to catch up without having to --

THE VIDEOGRAPHER: The time is 2:09 p.m. We're going off the record.

(Discussion off the record.)

THE VIDEOGRAPHER: The time is 2:15 p.m.

We're back on record.

Q. (BY MR. BROWN) What was Mr. Clark's age at the time of his diagnosis?

A. I don't --

Q. Do you recall that?

A. I don't recall.

Q. Was it 55 or 56, something like that?
That's what I'm -- I'll represent to you --
A. Okay.
Q. -- he was in his mid-fifties when he got diagnosed. Is that a typical decade in which you see the most AMLs being diagnosed in man?
A. I believe the most are diagnosed at somewhat older ages. It's still within this -- the distribution of where most occur -- fifties, sixties, seventies.
Q. Most of them occur, most diagnoses of leukemia occur in the seventies; correct?
A. Yes.
Q. And fewer in the sixties and even fewer in the fifties?
A. Correct.
Q. Which would tend to support, you know, these other environmental factors as being a cause; would you agree with that?

A. I don't know how you can say that.

Q. In the Brown & Root safety manuals that you say you reviewed, was there any reference in those manuals that prohibited the use of benzene as a cleaning solvent?

MR. MARTINGANO: Objection to form.

THE WITNESS: I don't recall language that specific.

Q. (BY MR. BROWN) I think we may have even talked earlier that you don't even recall benzene being mentioned except for one reference to its flash point.

A. That's correct.

Q. I don't know if we've talked about Exhibit 5. That is Dr. Infante's study on latency and cumulative exposure and leukemia cells types. Have you ever seen that document before, sir?

A. I may not have seen this. This is a journal I don't recognize.

Q. Well, I'm just asking you, have you seen it or not?

A. No.

Q. All right. What does Dr. Infante say, that I have highlighted there on that abstract?

A. "The latency period for benzene leukemia can

range from less than one year to more than 40 years after initial exposure, with the median latency, from various studies, ranging from nine to 35 years."

Q. If he's correct, Mr. Clark falls into the median range of latencies; correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm sorry. If... If who's correct?

Q. (BY MR. BROWN) If Dr. Infante is correct about his opinions on median latencies ranging from nine to 35 years, Mr. Clark's latency period would fall within that median range correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: If this is a correct -- I see what you're saying. If this is a correct statement, then Mr. Clark's latency was less than 35 years.

Q. (BY MR. BROWN) Right.

A. Which then puts it into the range --

Q. The median --

A. -- of nine to 35.

Q. That he refers to as the median range; correct? I'm correct about that?

A. That's correct, yes.

Q. Do you agree with his opinions?

A. I have not reviewed the evidence on which he bases that conclusion.

Q. All right. So, as you sit here, you can't disagree with that statement, without looking at his study; is that right?

A. I can't agree or disagree, because he

doesn't give, in this statement, the distribution. He gives the range. I don't know where the most fall.

Q. Okay. You testified in your earlier deposition that you knew Dr. Infante; correct?

A. Yes, sir.

Q. And that you knew him to be a qualified epidemiologist, such that he was qualified to express opinions on matters involving benzene-related diseases; correct?

A. I don't question his education or credentials.

Q. Have you spoken to any of the other experts hired by Brown & Root in this case, to formulate any of your opinions?

A. No, sir.

Q. Have you reviewed the depositions of any of plaintiff's experts in this case, to formulate your opinions?

A. Yes, I have.

Q. Which experts have you looked at?

MR. MARTINGANO: (Handing document.)

THE WITNESS: Thank you. I thought I was more organized. I have Dr. Infante's, Dr. Smith's, and Dr. Dement's. I'm sorry.

MR. MARTINGANO: For the record, Smith --

THE WITNESS: It's not Dr. Smith. I'm sorry. It was in the last group of materials I received, and Doctors Infante and Dement are the expert testimonies that I reviewed.

Q. (BY MR. BROWN) All right. Do you know Dr. John Dement?

A. I do.

Q. Have you -- what is your knowledge of his reputation as an epidemiologist and an industrial hygienist?

A. He has a phenomenal reputation. He's a good industrial hygienist and --

Q. All right.

A. -- knows much about epidemiology.

Q. And it's his opinions in this case, as you know, that Mr. Clark's AML was caused by his exposures to benzene; correct?

A. I believe that's a summary of his

representation.

Q. He would have, as an epidemiologist, factored in all the things that you have: the risk factors, the risk factor analysis that we have gone through, the latency period and everything else. And Dr. Dement comes up with the opinion that Mr. Clark's

exposure to benzene, as he testified, is a cause of his acute myelogenous leukemia.

Do you have any reason to dispute Dr. Dement's opinion, assuming that the exposures, as testified to by Mr. Clark and his coworkers, are true and accurate?

MR. MARTINGANO: Objection to form.

THE WITNESS: With that condition, I think I have no reason to object. Dr. Dement factors or places more weight on the deposition testimony of Mr. Clark and his coworkers than I do.

Q. (BY MR. BROWN) And you -- do you have an understanding, having been hired as an expert in a case before, about what an expert's job is, is to assist a jury in making its factual determinations in the case? Do you have that understanding?

MR. MARTINGANO: Objection to form.

THE WITNESS: Absolutely. Yes.

Q. (BY MR. BROWN) And you wouldn't want to

invade that jury's job in this case or have your beliefs or opinions about whether or not these individuals did or did not use benzene, as they said, whether or not they're telling the truth, you wouldn't want to take that job away from the jury, would you?

MR. MARTINGANO: Objection to form.

THE WITNESS: I'm sorry. I don't fully understand. I can either take a shot at answering, or you --

Q. (BY MR. BROWN) Well...

A. If you could rephrase it. I know what my job is. I guess I don't understand what you're talking about the jury's job.

Q. Well, if the jury's job is to determine the credibility of witnesses -- which it is -- are you in any better position than a jury to do that?

MR. MARTINGANO: Objection to form.

THE WITNESS: I guess I wouldn't say that that's my job. My job is to examine the facts in the case, from an epidemiological perspective, and help the jury understand what I do, from an epidemiological perspective, with respect to the relationships between benzene and disease, the kinds of information that people supply, and

whether that's accurate ways of representing exposures for scientific purposes.

Q. (BY MR. BROWN) It's not an epidemiologist's job to listen to workers' statements of how they got exposed to an agent and say -- and try to determine if they're telling the truth or not? That's not what

an epidemiologist does, is it?

A. Why not? If I'm doing a study of a workplace, I need to understand what the perceptions of exposure are and how reliable that information is. I like to have multiple sources, so I can validate that information. I think that employees' opinions of their exposures can be quite valuable and can be, you know, sometimes quite reasonable representations of what's going on, and other times, not so.

Q. Epidemiology is the study of epidemics; correct?

A. That's an oversimplification. I think there are many, many epidemiologists, including myself, that has never investigated an epidemic.

Q. What's your definition of epidemiology?

A. It's really the study of the relationships between and among various things we consider risk factors and the risks of disease and all its manifestations, and health, for that matter.

Q. It's not the study of whether somebody's telling the truth or not, is it?

A. Well, it's the identification of bias, meaning not that anyone intentionally misleads or gives bad information, but the study of why we see the patterns we do within certain studies is very

much the job of epidemiology.

Q. Do you have a study that shows or tends to prove that persons in Mr. Clark's situation or his coworkers' situation, who have absolutely no interest in this lawsuit, tend to show bias when they are involved in a lawsuit, I mean, from an epidemiological standpoint?

A. Yes.

MR. MARTINGANO: Objection to form.

THE WITNESS: Yes. There are studies that demonstrate -- it's called litigation bias.

Q. (BY MR. BROWN) And are those epidemiological studies?

A. There are epidemiological studies published. I don't -- I didn't present them here.

Q. Are those included in Exhibit 13?

A. No.

Q. You have not relied upon any of those studies in formulating your opinions; is that

correct?

MR. MARTINGANO: Objection to form.

THE WITNESS: That's correct. I was not asked -- I wasn't asked this line of questioning.

Q. (BY MR. BROWN) Would it be fair to say that you -- your conclusions about whether these men are

telling the truth or not or whether they actually used benzene, like they said they were, or not, are based on your common sense?

MR. MARTINGANO: Objection to form.

THE WITNESS: No. It's my 20-plus years of doing research in workplace settings, with all kinds of people and hazardous materials, and my understanding of the properties of the material in question here, benzene, in the context of a welding operation, is a very dangerous situation. It's not an opinion of someone who -- of a layperson.

Q. (BY MR. BROWN) All right. Is it your understanding that they only used benzene, Mr. Clark and his coworkers only used benzene to clean up welding machines in and around welding equipment?

A. No. I never said that. That fact that it is stated by one of the coworkers helps me to weight less that individual's testimony.

MR. BROWN: All right. I don't believe I have any further questions. I appreciate your time, sir.

MR. MARTINGANO: Okay. We'll reserve our questions until the time of trial.

MR. BROWN: We got you through by 2:30.

MR. MARTINGANO: Great. We're done.

THE VIDEOGRAPHER: The time is 2:27 p.m. The deposition of Dr. Kenneth Mundt is now adjourned. We are going off the record.

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CERTIFICATE OF DEPONENT

I, KENNETH A. MUNDT, PH.D., have read the foregoing transcript of the testimony given at the deposition on MONDAY, MAY 7, 2007, and it is true and accurate to the best of my knowledge and/or with the changes as noted in the attached errata sheet.

KENNETH A. MUNDT, PH.D.

Subscribed and sworn to before me this day of , 2007.

Notary Public/Commissioner of Deeds

My Commission Expires:

20

21

22 CAUSE NO. 06-H-0395-C
AUBREY CLARK AND WIFE, KELLY CLARK
23 vs.
KELLOGG BROWN & ROOT, LLC AND HALLIBURTON COMPANY
24 KENNETH A. MUNDT, PH.D., (AM), MAY 7, 2007
JER
25

NIZIANKIEWICZ & MILLER
(860) 291-9191

C E R T I F I C A T E

I, Jill E. Remillard, License #385, a Notary Public for the State of Connecticut and Commonwealth of Massachusetts, do hereby certify that the deposition of KENNETH A. MUNDT, PH.D., was taken before me pursuant to the Texas Rules of Civil Procedure, at Sheraton Bradley Hotel, 1 Bradley International Airport, Windsor Locks, Connecticut 06096, commencing at 10:08 a.m. on MONDAY, MAY 7, 2007.

I further certify that the witness was first sworn by me to tell the truth, the whole truth, and nothing but the truth and was examined by counsel, and his testimony was stenographically reported by me to the best of my ability and subsequently transcribed as herein before appears.

I further certify that I am not related to the parties hereto or their counsel and that I am not in

any way interested in the events of said cause.

Witness my hand this 8th day of MAY, 2007.

Jill E. Remillard, Notary Public

My Commission Expires: January 21, 2011 (In MA)

My Commission Expires: August 31, 2010 (In CT)

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