# Exhibit 155

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
SOUTHERN DIVISION
No. 7:23-CV-00897

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IN RE:
CAMP LEJEUNE WATER LITIGATION

This Document Relates to:
ALL CASES

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# EXPERT VIDEO-RECORDED DEPOSITION OF STEPHEN H. CULP, MD, PHD

Thursday, May 8, 2025
10:00 AM EASTERN TIME

Reported by: Denise Dobner Vickery, CRR, RMR
JOB NO.: 7330193

Thursday, May 8, 2025
10:00 AM EASTERN TIME

Video-Recorded Expert Deposition of STEPHEN H. CULP, MD, PHD, at the offices of:

ALLEN ALLEN ALLEN & ALLEN PC
946 Grady Avenue, Suite 201
Charlottesville, VA 22903

Pursuant to notice, before Denise Dobner Vickery, Certified Realtime Reporter, Registered Merit Reporter, and Notary Public in and for the Commonwealth of Virginia.

APPEARANCES:

Representing the Plaintiffs Leadership Group:

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APPEARANCES: (CONTINUED)

ALSO PRESENT:

Gordon Thomas, Videographer

ALSO PRESENT VIA ZOOM:

Ted Ruzicka, Esq. - Davis Bethune

Jenna Butler, Esq. - Ward & Smith

Zina Bash, Esq. - Keller Postman

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DEPOSITION EXHIBITS
(Attached to transcript.)

P R O C E E D I N G S

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THE VIDEOGRAPHER: We are now on the record.

My name is Gordon Thomas and I'm a videographer for Golkow. Today's date is May 8, 2025, and the time is 10:00 AM.

This video deposition is being held at 946 Grady Avenue, Suite 201, Charlottesville, Virginia 22903, in the matter of In re: Camp Lejeune Water Litigation for the United States District Court for the Eastern District of North Carolina.

The deponent is Dr. Stephen Culp.

Will counsel please identify themselves.

MS. KONSTANTOPOULOS: Melanie Konstantopoulos on behalf of the United States.

MS. KLIMEK: Amy Klimek on behalf of the United States.

MR. WALLACE: Pat Wallace of the PLG and Milberg law firm appearing with my co-counsel and associate, Amanda Memmer on behalf of the PLG and Milberg.

THE VIDEOGRAPHER: And Zoom participates will be noted on the stenographic record.

And the court reporter is Denise Vickery, who will now swear in the witness.

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STEPHEN H. CULP, MD, PHD

called for examination, and, after having been duly sworn, was examined and testified as follows:

- - -

EXAMINATION

- - -

BY MS. KONSTANTOPOULOS:

Q. Good morning again, Dr. Culp. I know I already introduced myself, but for the record, my name is Melanie Konstantopoulos. I represent the United States. Thank you for being here today.

Can you please state your full name for the record.

A. Stephen Culp.

Q. What is your current business address?

A. Good question.

My -- my home address is for this purposes is 6 Queens Anne Court, Palmyra, Virginia 22963.

Q. And are you using your home address as your business address?

A. For my consulting, yes.

Q. For your consulting work in this case?

A. Yes.

Q. As an expert --

A. Yes.

Q. -- in this matter?

I'd like to go over some preliminary deposition matters to ensure we are all on the same page.

First and foremost, do you understand that a few minutes ago you took an oath to tell the truth?

A. Yes.

Q. And do you understand that this is the same oath that you would take in a court subject to the same penalties of perjury?

A. Yes.

Q. I will ask questions and please answer them to the best of your ability. If you do not understand a question, please let me know and I will try to clarify. If you do not ask for clarification, I will assume you understood the question.

Is that fair?

A. Yes.

Q. During the deposition, the court reporter, as you can see, will record and transcribe everything we say here today.

To make sure her job is easier and to make sure that we have a clear record, when answering the question, please verbalize your answers so that the court reporter can accurately transcribe them. If the answer is yes or no, please say yes or no. They cannot transcribe uh-huh or huh-uh, and they cannot see or transcribe whether you nod your head, shaking in

the affirmative or negative.

A. Correct.

Q. Okay. In a normal conversation, it's typical that you may anticipate what I am asking before I complete the question and want to answer before I finish, but for the record and for the court reporter, I ask that you let me finish my question completely before answering. The court reporter cannot accurately transcribe if we're talking over each other.

A. Understood.

Q. And I will -- and I will, of course, extend the same courtesy. Maybe not right there, but I will do it later.

Please talk at a reasonable pace, like the pace I am speaking now, so the court reporter can record everything.

During the deposition, you may hear other attorneys say "objection." Unless your attorney instructs you specifically not to answer the question, please answer the question after -- after the objection has been made.

Do you understand?

A. Yes.

Q. We can take breaks from time to time. If you need to take a break, please let me know. I simply ask that you answer my question, if that question is still pending, before we take the break.

Do you understand?

A. Yes.

Q. Is there any reason why you are unable to give your most truthful and accurate -- accurate testimony here today?

A. No.

Q. Is there any reason your memory might be impaired today?

A. No.

Q. Is there any reason your memory -- oh, are you currently taking any medication that might impair you?

A. No.

Q. Did you do anything in preparation for today's deposition?

A. I did.

Q. What was that?

A. I reviewed my report that I submitted, I met with counsel yesterday, and I

reviewed any articles that stood out in my report.

Q. You said you met with counsel yesterday.

How long did that meeting last?

A. Three hours.

Q. Was anyone else present in those meetings?

A. No.

Q. Did you also meet with counsel prior to today's deposition today?

A. Yes.

Q. And how long did that meeting last?

A. I mean, I met with them not necessarily about the deposition but meeting them -- with them regarding drafting, you know, the report and things like that.

Q. Are you referring to meeting with them to draft a report this morning?

A. No.

Q. Okay. Earlier you indicated that in preparation for today's deposition, you reviewed some of the studies from your report.

Which studies did you review?

A. Mainly the Bove studies.

MS. KONSTANTOPOULOS: I'm going to show you what I'm marking as Exhibit 1, which is the subpoena that was sent to you, and notice of deposition.

(Document marked for identification as Culp Exhibit 1.)

BY MS. KONSTANTOPOULOS:

Q. Do you recognize this as your subpoena and notice of a deposition for today?

A. Yes.

Q. If you turn to Attachment A near the end of the document, this is the request for production of documents attached to your deposition notice that you received; is that correct?

A. Yes.

Q. Did you review this request for production of documents?

A. Yes.

Q. I'm going to go through these questions.

Do you have any responsive documents to Attachment A that you would like to share here today?

A. No.

Q. Okay. I'm going to go through Attachment A. Number 1. The request specifically asks for: All e-mails, letters, correspondence, text messages, conversations, chats, voicemails, data, technical files, or other communications pertaining to Camp Lejeune sent or received prior to your retention as an expert in this matter, including to, from, or with Morris Maslia or David Savitz.

Do you have -- did you have any communications with either prior to your retention as an expert in this matter?

A. No.

Q. For number 2. All e-mails, letters, correspondence, text messages, conversations, chats, voicemails, data, technical files, or other communications pertaining to Camp Lejeune, including, from, or with: Robert Faye, Jason Sautner, Rene Suarez-Soto, Susan Martel, Scott Williams, Frank Bove, Mike Partain, Jerry Ensminger, Lori Freshwater, and Paul Rosenfeld.

Did you have any such communications?

A. No.

Q. For number 3 we requested: All e-mails, letters, correspondence, text messages, conversations, chats, voicemails, or other communications to, from, or with any individual who has filed a claim with the Department of the Navy or the Eastern District of North Carolina pursuant to the Camp Lejeune Justice Act of 2022.

Do you have any such correspondence?

A. No.

Q. Have you had any such correspondence?

A. No.

Q. And the 4th is for bills, invoices, or other documents reflecting compensation paid by you -- excuse me -- to you related to this litigation.

I know counsel has provided a copy of invoices prior to today's deposition.

Are there any additional invoices that you intend to produce?

A. No.

Q. How did you first learn about this matter?

A. I was -- I work with the Medical Science Associates, who requested if I was interested in lending help as an expert witness in this matter.

Q. Who is Medical Science Associates?

A. It's a company I've worked with for a decade now on various projects, namely, expert opinions, things like that, who help facilitate, you know, the administrative support for me to work directly with clients.

Q. What do you mean by "administrative support"?

A. Mainly just scheduling, any sort of -- at my direction and approval, any sort of pulling different manuscripts, papers, studies, that I can then review in a cost-effective manner.

Q. Does anyone employed by Medical Associates, other than yourself, review any of the documents that you indicated that they pull for you?

A. Not to my knowledge.

Q. And approximately when were you first contacted by Medical Science Associates about this case? Approximately what date?

A. I don't know exactly, but I believe it was about two years ago.

Q. And do you have the ability to potentially turn down any request for your expert services when Medical Science Associates reaches out to you regarding a potential case?

A. Yes, and I have in the past.

Q. Okay. When were you retained in this litigation?

A. I do not know the exact date.

Q. Was it in 2023?

A. Yes.

Q. Do you recall approximately what month you were retained?

A. I'm going to say it was around May/June, but I'm not sure.

Q. Do you have a retainer agreement?

A. Yes.

Q. Do you have a copy of that retainer agreement here with you today?

A. Not with me today, no.

Q. Okay. Did you perform any work in connection with this matter prior to executing a retainer agreement?

A. No.
Q. When you were first retained, what information were you provided with at the time?
A. The first information I was provided with that was two ATSDR reports and the -- the mandate of what was expected of expert witnesses at the time.
Q. What was that mandate?
A. To review in my capacity the available literature, the available studies, and assess whether or not it is my opinion that there was a causal -- a causal association between contaminated water at Camp Lejeune and, for me specifically, bladder cancer.
Q. And just to make sure, were you retained by Medical Science Associates or by plaintiffs' counsel in this case?
A. Plaintiffs' counsel.
Q. Okay. Are you a contractor that works for Medical Science Associates or are you an employee?
A. I'm not an employee. More of a consultant.
Q. And who provided you with the ATSDR

Camp Lejeune studies? Was it plaintiffs' counsel or was it Medical Science Associates?

A. Plaintiffs' counsel.

Q. Is it your understanding that you may testify as an expert in any other part of this litigation aside from the content that's contained in the expert report that you're being deposed about today?

A. Please clarify.

Q. Sure.

You have submitted a general causation expert report in this case; correct?

A. Correct.

Q. Do you anticipate testifying in this case for -- in any other capacity besides the opinion you made -- you had made in the general causation report?

A. No.

Q. Have you been a treating provider for anyone who has claimed injury in this lawsuit?

A. Not to my knowledge.

Q. Before we go any further, I'd like to establish a few abbreviations that I'll use throughout this deposition that I hope we can

agree to.

I will list them all, and if you have any objection, please let me know.

When I say TCE, I am referring to trichlorothylene -- trichloro?

A. Ethylene.

Q. Ethylene, yes.

Do you agree?

A. Yes.

Q. Okay. When I say PCE, I'm referring to tetrachlorothylene -- chloro --

A. Ethylene.

Q. Tetrachloroethylene.

A. PCE. Agree.

Q. Or -- or perchlorothylene? (Laugh).

A. I agree.

Q. Okay. Thank you. This is why we have abbreviations.

When I say --

MR. WALLACE: I'm just going to -- when you -- that last abbreviation you or statement you said perchlorothylene. Did you mean to say perchloroethylene?

THE WITNESS: Yes.

MS. KONSTANTOPOULOS: Yes, I did.

MR. WALLACE: All right. Just to make sure. Because the very last thing you said was thylene. Okay. Thank you.

MS. KONSTANTOPOULOS: Thank you, counsel.

MR. WALLACE: Good.

BY MS. KONSTANTOPOULOS:

Q. When I say IARC, I'm referring to the International Agency for Research on Cancer.

A. Agree.

Q. When I say EPA, I'm referring to the United States Environmental Protection Agency.

A. Agree.

Q. When I'm referring to ATSDR, I'm referring to the Agency for Toxic Substances and Disease Registry.

A. Agree.

Q. Okay. Are you familiar with the terms I just listed?

A. Yes.

Q. And you can pronounce them much better than me.

A. Maybe.

MS. KONSTANTOPOULOS: You filed an expert report in this matter that I'm going to mark as Exhibit 2, which is entitled "Rule 26 Report of Stephen H. Culp, MD PhD."

(Document marked for identification as Culp Exhibit 2.)

BY MS. KONSTANTOPOULOS:

Q. Please turn to page 46 of your report.

That's your signature page; correct?

A. Yes.

Q. And there were two exhibits included with your expert report; correct?

A. Yes.

Q. Okay. Exhibit A is a copy of your curriculum vitae, or CV?

A. Correct.

Q. And Exhibit B is a copy of your fee schedule?

A. Let me confirm.

Yes. (Laugh).

Q. Wonderful.

On page 1 of your expert report, you reference Materials Considered List as Exhibit C and indicate that this will follow; is that correct?

A. Correct. That's not here.

Q. Correct.

And counsel later provided something called "reliance files" --

A. Correct.

Q. -- in lieu of Exhibit C; is that correct?

A. Correct.

Q. Okay. We can go over that later.

All right. I'm going to go -- I'm going to direct your attention to Exhibit 2, specifically Exhibit A of Exhibit 2 of your expert report, which is your CV.

Have there been any changes to your CV since you filed your expert report in December 2024?

A. No major changes, other than there's been a few manuscript submissions and acceptance

since then unrelated to this matter.

Q. According to your expert report, you are a physician and surgeon licensed to practice medicine in the Commonwealth of Virginia; correct?

A. Correct.

Q. Your CV states that you devote 80 percent of your professional time to your active clinical practice and instruction at the UVA School of Medicine; correct?

A. Correct.

Q. What is the remaining 20 percent of your practice devoted to?

A. Admin, research, participation in didactic conferences for residents and medical students. That's pretty much it.

Q. You obtained your medical license in the State of Virginia in 2011 and are still currently licensed; is that correct?

A. Correct.

Q. You were previously licensed in Texas and Washington, however, those licenses expired; is that correct?

A. Correct.

Q. You became board-certified in

urology by the American Board of Urology in 2013 and this was renewed in 2023; correct?

A. Correct.

Q. According to your CV, this is the only certification that you have.

Is that still correct?

A. Correct.

Q. You underwent your resident training in urology at the University of Washington in Seattle in 2008; correct?

A. Correct.

Q. During that time, you also obtained a Master of Science in epidemiology in 2006?

A. Correct.

Q. You have been practicing urology -- in urology and urologic oncology at UVA since August of 2011; is that right?

A. Yes.

Q. And you're currently a full professor with tenure in the Department of Urology at UVA correct?

A. Correct.

Q. As a practicing urologic oncologist, would you agree that you manage patients and

operate on genitourinary cancer, including kidney, bladder, and prostate cancer?

A. Correct.

Q. You listed your specialties in the field of medicine in your expert report; isn't that correct?

A. Correct.

Q. And just pointing your attention to the last paragraph on page 1 of your expert report, you indicated that you specialized -- expert report, Exhibit 2.

You indicated that you specialize in open radical nephrectomy and complete partial nephrectomy, radical cystectomy with urinary diversion, open prostatectomy, retroperitoneal lymph node dissection, and penectomy with inguinal lymph node dissection for penile cancer.

So far is that correct?

A. Yes.

Q. And on page -- the next page, you also indicated that you specialize in the endoscopic management of urothelial carcinoma; correct?

A. Correct.

Q. You didn't list any other specific specialties in your expert report; is that fair?
A. Fair, yes.
Q. In your CV, which is Exhibit 2, Exhibit A on pages 4 to 5, you listed your clinical areas of research interest which includes bladder cancer; correct?
A. Correct.
Q. Under the heading for Bladder Cancer, you specified that you were interested in predictors of high versus low risk muscle-invasive disease and need for neoadjuvant chemotherapy prior to radical cystectomy, and the role of TMT in treatment of patients with muscle-invasive bladder cancer; correct?
A. Correct.
Q. You would agree that your clinical research related to bladder cancer is focused on the treatment of bladder cancer; correct?
A. For the most part, yes.
Q. You would agree that your Honors and Awards listed on page 3 of your CV are focused on your work in urology; correct?
A. Besides the one, the awards in

medical school, yes, they're all urologic related.
Q. What is the other one related to?
A. I mean, prior to my residency, the Alpha Omega Alpha is the society within medical school. Anybody, doesn't have to be urologic specific, as well as the scholarship was awarded. Those were medical school related, not necessarily urology.
Q. Understood.
And that's not in a specific specialty --
A. No.
Q. -- is that correct?
Okay. You do not currently hold any certifications in the field of epidemiology; correct?
A. No.
Q. You do not currently hold any certifications in the field of toxicology; correct?
A. Correct.
Q. You do not hold a professorship in the field of epidemiology; correct?
A. Correct.

Q. You do not hold a professorship in the field of toxicology; correct?
A. Correct.
Q. You indicated on page 2 of Exhibit 2 of your expert report that "I have authored multiple manuscripts on population-based epidemiological studies."
What do you mean by "manuscripts"?
A. Manuscripts are papers that are studies that are written up, submitted to a specific journal, and accepted for publication.
Q. Are those studies peer reviewed?
A. Yes.
Q. You would agree that your CV includes a number of publications that you have authored; correct?
A. Correct.
Q. Can you point out which of those publications are manuscripts based on population -- can you identify which of those publications are manuscripts on population-based epidemiological studies?
A. (Reviews document.)
Number 9. Number 13. Number 21.

Number 22. Number 23. Number 39. Those are the manuscripts.

You want me to go through the abstracts as well.

Q. Are there additional abstracts that you would qualify as manuscripts?

A. Potentially, yeah.

Q. Yes, please.

A. (Reviews document.)

Number 13 in the abstracts. That also is correlated with one of the manuscripts, but just for completeness.

Q. What page are you looking at?

A. 27.

Q. Thank you.

A. Number 16.

Q. Are you referring to number 16 on page 27?

A. Yes.

Number 20 on page 27. Number 24 on page 28. Number 25 on page 28.

(Reviews document.)

Number 54 on page 30. Number 57 on page 31. Number 58 on page 31. Number 59 on page

41. Number 60 on page 31. And that's it.

Q. Thank you for going through those.

Of those manuscripts that you pointed out, is number 13 the only population-based study that dealt specifically with bladder cancer?

A. That was actually dealt with upper tract urothelial carcinoma. So not bladder, but upper like kidney and ureter.

Q. Did any of the studies -- population-based studies that you just listed specifically address bladder cancer?

A. No, not the population-based.

Q. Okay. Thank you.

You would agree you've never published peer-reviewed articles specifically addressing the association between PCE and bladder cancer; correct?

A. Correct.

Q. You would agree you've never published peer-reviewed articles specifically addressing the association between TCE and bladder cancer; correct?

A. Correct.

Q. You would agree you have never published peer-reviewed articles specifically addressing the association between benzene and bladder cancer; correct?

A. Correct.

Q. And you would agree that none of the publications you have authored analyze the effects -- the effect of environmental contaminants such as PCE, TCE, and benzene on bladder cancer; correct?

A. Correct.

Q. Okay. Moving on. In your expert report, Exhibit 2 page 1, you stated:

"I have not provided an expert opinion -- expert opinion testimony in deposition or at trial in the last four years."

A. Correct.

Q. Is that correct?

A. Yes.

Q. And you have never testified as an expert in the field of epidemiology; correct?

A. Correct.

Q. And you have never testified in the field -- as an expert in the field of toxicology;

correct?

A. Correct.

Q. Have you ever served as an expert witness in a toxic tort case?

A. No.

Q. Have you ever testified as an expert in the field of urology?

A. Please clarify.

Q. Testify. Have you ever testified as an expert in the field of urology at a dep -- in a court?

MR. WALLACE: Objection.

THE WITNESS: I have worked on a malpractice case as -- one malpractice case, literally my only other trial, dealing with penile cancer as an expert for the plaintiff.

BY MS. KONSTANTOPOULOS:

Q. And did you testify in court in that malpractice case that you just referenced?

A. I did.

Q. And were you admitted as an expert in the field of urology related -- relating to penile cancer?

A. I -- yes. I mean, I assume so. I mean, that's why I was retained.
Q. Were you deposed in that case?
A. Yes.
Q. Have you ever been deposed in connection with your work as an expert witness other than that case?
A. No.
Q. The malpractice case that you're referring to, was that a case in Tennessee from 2019 entitled Lyle versus McDaniel?
A. Yes.
Q. Have you ever been retained as an expert in any other cases?
A. No.
Q. Prior to this case, have you ever worked for Bell Law Group?
A. No.
Q. Keller Postman?
A. No.
Q. Lieff Cabraser Heimann & Bernstein?
A. No.
Q. The Dowling law firm?
A. No.

Q. Weitz & Luxenberg?
A. No.
Q. Wallace & Graham?
A. No.
Q. Motley Rice?
A. No.

MS. KONSTANTOPOULOS: Okay. I would like to mark as Exhibit 3 Plaintiffs' Designation of Phase II Expert Witnesses with Respect to Bladder Cancer Stephen H. Culp's Reliance Files.

(Document marked for identification as Culp Exhibit 3.)

BY MS. KONSTANTOPOULOS:

Q. Are you familiar with this document?
A. Yes.
Q. Did you provide a list of publications or reliance files with the designation?
A. Please clarify.
Q. This document includes a list of the documents that you relied upon in forming your expert opinions in this case; correct?
A. Correct.

Q. Okay. Did the reliance files list include all of the materials, facts, and data you considered in forming your opinions?

A. Yes.

Q. And if something is not included, then you didn't consider it; is that fair?

A. Correct. And I would add, the only addition, we made one addition. The manuscript by Dr. Yu, Y-u. That's -- I don't know if that's -- I don't think that's listed on here, but that's an additional one that came after the report that I reviewed and considered.

Q. What is the name of that study?

A. It looked at low level -- levels of benzene using the UK database -- I don't know the -- I think we provided that as a late submission -- in a population-based study out of the UK that was published in March of this year.

MS. KONSTANTOPOULOS: Okay. Counsel, have you provided a copy of that report?

MR. WALLACE: I believe we have.

MS. KONSTANTOPOULOS: Or

amended?

Do you have a copy of that report here today?

MR. WALLACE: I don't have it with me right now, no.

MS. KONSTANTOPOULOS: Okay. Thank you.

BY MS. KONSTANTOPOULOS:

Q. Now, earlier in your -- in your expert report in Exhibit 2, you mentioned Exhibit C, which you referenced as a Materials Considered List; is that correct?

A. Correct.

Q. But this document uses the term "reliance files"; correct?

And by "this document" I'm referring to Exhibit 3.

A. (Reviews document.)

Correct. It says "reliance files."

Q. Is there any difference between the term "materials considered" and "reliance files"?

A. I mean, this is a complete list of everything I reviewed or at least --

Q. By "this" you're referring to

Exhibit 3?

A. Yes.

Q. Okay.

A. This is a complete list of everything I pulled and reviewed, at least initially. My reliance, though, was obviously heavy on certain studies as opposed to other. This is mainly for completeness that this is what I pulled initially to review. Some of these studies were not relevant in my opinion, and I did not rely on them.

Q. Thank you.

In your reliance files, you indicated that you have reviewed reports from the following experts: Benjamin Hatten, Laura Plunkett, Morris Maslia, Kathleen Gilbert, Stephen Bird?

A. Correct.

Q. And that would be towards the end of the reliance files.

A. Correct.

Q. Exhibit 3.

Have there been any other reports that you reviewed from any other experts since you

filed Exhibit 3 -- since Exhibit 3 was filed?

MR. WALLACE: Objection.

THE WITNESS: Dr. Shields and Dr. Goodman. I reviewed their reports.

BY MS. KONSTANTOPOULOS:

Q. In addition, Exhibit 3 indicates that you reviewed the prior deposition of Frank Bove and Morris Maslia; is that correct?

A. Correct.

Q. Have you reviewed any other depositions?

A. Not to my knowledge.

Q. Since you prepared your expert report, have you read any other -- any of the other plaintiffs' expert reports?

MR. WALLACE: Objection.

THE WITNESS: Not unless they're listed, no.

BY MS. KONSTANTOPOULOS:

Q. All right. I'm looking at Exhibit 2 page 2 of your expert report under the section entitled "Mandate." There you stated:

"I was asked to review the published epidemiological literature and other relevant

publications to determine whether there is a causal relationship between bladder cancer and exposure to PCE, TCE, benzene and the contaminated water at Camp Lejeune" related to this lawsuit.

Did I read that correctly?

A. Yes.

Q. You did not opine on whether a causal relationship exists for vinyl chloride and bladder cancer; correct?

A. Correct.

Q. To identify relevant literature in support of your mandate, you performed a literature search on PubMed; correct?

A. Correct.

Q. PubMed is the National Library of Medicine through the National Institute of Health; correct?

A. Correct.

Q. You used the following search terms: bladder cancer, urothelial cancer, PCE, TCE, benzene, and dry cleaning; is that correct?

A. Correct.

Q. Are there any other search terms that you used?

A. Not to my knowledge.

Q. How did you come up with your search terms?

A. I tried to be as exact as possible but yet generalizable enough to capture as many studies as possible. Obviously I wanted to, number one, see what studies were out there that specifically examined these chemicals and their relationship with bladder cancer, if there was a relationship, or had -- if those studies had been done, and to try to best match the cohort of Camp Lejeune as to exposure through contaminated water, dry cleaning.

And I tried to -- because most studies -- the value of a study in this situation, whether or not it's a good study or a bad study, if it can't be generalized to the group of interest, then it's not really applicable. So I wanted to be as specific as possible, but yet have some generalities to it.

Q. Along those lines, why did you use the occupation of dry cleaning as a search term as opposed to any other occupation?

A. Dry cleaning mainly because of the

report, ATSDR report, looking at the contamination by the dry cleaning business at Camp Lejeune.

Q. And you used the search terms bladder cancer and urothelial cancer.

You agree that urothelial -- urothelial cancer is the most common type of bladder cancer; correct?

A. Correct.

Q. And you are not opining on the effect of PCE, TCE, or benzene on the effect of squamous cell carcinoma or adenocarcinoma; is that correct?

A. Correct.

Q. And as a part of your analysis in your expert report, which is marked as Exhibit 2, you didn't rely on analyzing -- you didn't analyze plaintiffs' medical records in order to form your opinion; correct?

A. Correct.

Q. And in your report, Exhibit 2, you did not opine on the exposure levels of PCE, TCE, or benzene necessary to cause bladder cancer; correct?

A. Correct.

Q. Looking again at Exhibit 2 on page 2, you stated:

"The standard of proof for my review is determined by the Camp Lejeune Justice Act of 2022, which states: BURDENS AND STANDARD OF PROOF - (1) IN GENERAL - The burden of proof shall be on the party filing the action to show one or more relationships between the water at Camp Lejeune and the harm. (2) STANDARDS - To meet the burden of proof described in paragraph (1), a party shall produce evidence showing that the relationship between exposure to the water at Camp Lejeune and the harm is - (A) sufficient to conclude that a causal relationship exists; or (B) sufficient to conclude that a causal relationship is at least as likely as not."

Did I read that correctly?

A. Yes.

Q. Did the plaintiffs' attorneys provide you with the BURDENS AND STANDARD OF PROOF section of the Camp Lejeune Justice Act?

A. They did.

Q. And that occurred when you were first retained?

A. Yes.
Q. Did the plaintiffs' attorney tell you to rely on that association -- that section in your analysis?
MR. WALLACE: Objection. I'm going to ask the witness to refrain from disclosing any communications he's had with counsel.
THE WITNESS: I accept plaintiffs' attorney's recommendation and respectfully won't answer.
MS. KONSTANTOPOULOS: For the record, Federal Rule of Civil Procedure 26(b)(4)(C)(iii) allows inquiries into attorney expert communications concerning assumptions relied upon.
BY MS. KONSTANTOPOULOS:
Q. In your reliance -- in Exhibit 3, which I'm referring to as your reliance files, you list the court's opinion of June 5, 2024, and this is on page 8 number 132.
A. Uh-huh.
Q. Did you review that order?
A. I was provided it, but I reviewed

it, but it did not -- I did not -- I'm not a lawyer. I don't -- didn't understand much of it. So I did not rely on it. Or it did not form any basis of my opinion.

Q. And is it fair to say you don't have legal training to evaluate that court order or legal standard?

A. My legal training is limited. So I -- very limited since I didn't go to law school. So I would -- I would err on the side of not trying to understand or read into it.

Q. So you would agree you don't have legal training to opine on whether burden of proof used to evaluate evidence in a legal case is the same as the standard that scientists use to evaluate epidemiologic findings?

MR. WALLACE: Objection.

THE WITNESS: Please clarify.

BY MS. KONSTANTOPOULOS:

Q. Sure.

You would agree you don't have any legal training to opine on whether a burden of proof used to evaluate evidence in a legal case is the same as a scientific standard?

MR. WALLACE: Same objection.

THE WITNESS: I don't agree.

BY MS. KONSTANTOPOULOS:

Q. Why don't you agree?

A. I believe I'm sufficiently trained to evaluate literature in epidemiology and bladder cancer to form opinion, regardless of the legal implications but to, you know, based on the mandate, I believe I am able to do that.

Q. Is it fair to say, though, that you agree you don't have legal training to opine on a legal burden of proof -- the meaning of a legal burden of proof?

MR. WALLACE: Objection.

THE WITNESS: I would -- I would disagree.

BY MS. KONSTANTOPOULOS:

Q. You do have legal training?

A. No, I don't have legal training per se, but I have enough to understand the mandate. I do feel I am sufficiently capable of understanding the mandate that was presented.

Q. Going back to Exhibit 2 page 2 of your expert report, you go on to state:

"This legal standard is consistent with the 'equipoise and above' classification of the evidence described in the scientific literature. Using this standard, my report will examine whether the published epidemiological literature on exposure to PCE, TCE, benzene, and the contaminated water at Camp Lejeune provides sufficient evidence to conclude that exposure to the same causes or is as likely as not a cause of bladder cancer."

Did I read that correctly?

A. Yes.

Q. In this section, you mention the "at least as likely as not" language from the Camp Lejeune Justice Act; correct?

A. Yes.

Q. For purposes of your expert report, do you equate equipoise and above with at least as likely as not?

A. I don't routinely use equipoise -- the word "equipoise" since it's a nonmedical term in my day-to-day life. I rely more on the "as likely as not."

Q. Is as likely as not a scientific

term?

A. It can be.

Q. In what context?

A. There are certain situations clinically that, you know, for instance, with bladder cancer, when I resect a bladder tumor out of the bladder, I usually tell the patient there's a 50 percent chance of there being a new tumor in the future.

So even though that's not a statistical study, it's as likely as not that they're going to develop a new tumor in the future.

Q. So you use the term "as likely as not" to describe a patient's chances of recovery so that they can understand it; correct?

A. Correct.

MR. WALLACE: Objection.

BY MS. KONSTANTOPOULOS:

Q. But it is not a scientific standard that has been peer reviewed; is that fair?

MR. WALLACE: Objection.

THE WITNESS: I mean, I've seen it in the literature but not -- when

a study is performed, it is not uncommon for the authors to elaborate on other findings in a study that necessarily were not part of that hypothesis, and I've seen that used before.

BY MS. KONSTANTOPOULOS:

Q. Do you know where the ATSDR Assessment of Evidence from 2017 got the "equipoise and above" standard from?

A. If I remember correctly, I think it was based on the available studies that they reviewed and determined that they -- these studies showed a possible or probable association, but I'm not exactly sure. I can't remember exactly.

Q. And you have reviewed Frank Bove's deposition; isn't that correct?

A. Yes.

Q. Okay. Are you aware that Frank Bove testified in his deposition that ATSDR picked this classification scheme due to time constraints and to add diseases to the VA Presumptive List?

MR. WALLACE: Objection.

THE WITNESS: Yes.

BY MS. KONSTANTOPOULOS:

Q. Would you agree that the equipoise -- that equipoise can be used in clinical research to refer to a situation where there is uncertainty and not a balance of opinions?

MR. WALLACE: Objection.

THE WITNESS: I would not agree that it's uncertainty as much as it is a difference of opinion.

BY MS. KONSTANTOPOULOS:

Q. Would you agree equipoise and above gives the veteran a benefit of the doubt?

MR. WALLACE: Objection.

THE WITNESS: I -- I have no opinion on that, really.

BY MS. KONSTANTOPOULOS:

Q. Okay. And you recall that Dr. Bove in his deposition stated that "the equipoise and above standard" gives the veteran the benefit of the doubt, don't you?

MR. WALLACE: Objection.

THE WITNESS: I don't remember that specifically.

BY MS. KONSTANTOPOULOS:

Q. Would a copy of his deposition

refresh your recollection?

A. Sure.

MS. KONSTANTOPOULOS: I am going to mark Frank Bove's deposition transcript as Exhibit 4.

(Document marked for identification as Culp Exhibit 4.)

BY MS. KONSTANTOPOULOS:

Q. I'm going to point your attention to page 277 line 2.

Question: "And how does this classification scheme, in your view, give the veteran the benefit of the doubt?"

Answer: "Well, having an equipoise and above does that. And I think that's what I -- what the IOM thought."

And to be clear, I have marked the videotaped and videoconferenced deposition of Dr. Frank J. Bove taken Thursday, October 17, 2024 as Exhibit 4.

Does that help refresh your recollection?

A. Yeah. I mean, he stated it.

Q. Fair enough.

In your scientific or medical manuscripts or research, have you ever arrived at a conclusion by giving a subject the benefit of the doubt?

A. No.

Q. Do scientists in your field arrive at conclusions by giving one study group the benefit of the doubt over another?

A. No.

Q. Is there an empirical metric that you're aware of for benefit of the doubt?

A. Not from a scientific viewpoint, no.

Q. Okay. Going back to Exhibit 2 of your expert report on page 3, you describe your methodology and the Bradford Hill criteria; is that correct?

A. Correct.

Q. And on page 5 you explain the urinary system and bladder cancer generally, correct, including treatment, outcomes and latency?

A. Correct.

Q. You agree that bladder cancer is the fourth most common cancer amongst men; correct?

A. In the U.S., correct.
Q. And is it the sixth most diagnosed -- diagnosed cancer generally?
A. Based on the American Cancer Society, yes.
Q. Okay. You would agree that the median age of diagnosis for men with bladder cancer is 69 years old; is that right?
A. I know the average age is 73. Average age is 73. I'm not -- I can't say the median age. I don't have it here.
Q. You would agree that the most common risk factor for bladder cancer is smoking; correct?
A. That has been shown, that has been explored, but I believe that bladder cancer is -- my -- my -- my personal opinion is that bladder cancer is a very exposure-related disease. There are no genetic syndromes associated with bladder cancer. There's no genetic deficiencies that have been shown to initiate bladder cancer.
And it's my opinion that it's fully an exposure-related urothelial, not squamous or adenocarcinoma, but urothelial is an

exposure-related disease and, yes, smoking has been shown as a definite risk factor for the development of bladder cancer.

Q. What are the well-established risk factors for bladder cancer?

A. Age, smoking, occupational exposure for urothelial would be the main, major ones.

Q. Okay.

A. And, well, gender, male versus female, but that could be related to exposure.

Q. You would agree that exposure to PCE, TCE, or benzene is not a well-established risk factor that urologists would typically consider in their everyday practice; correct?

MR. WALLACE: Objection.

THE WITNESS: Urologists would -- urologic oncologists typically would use occupational exposure as a risk factor, not necessarily going down to specific chemicals.

BY MS. KONSTANTOPOULOS:

Q. Moving on to page 4 of your expert report, which is Exhibit 2, you indicated:

"In its 2017 assessment of the Camp

Lejeune water contamination, ATSDR applied the 'at least as likely as not' standard (ATSDR, 2017). In doing so, it announced that it did not use confidence intervals to establish statistical significance, explaining that there are limitations of using statistical significance testing and that the failure to achieve statistical significance does not indicate lack of evidence for a causal association."

Did I read that correctly?

A. Yes.

Q. You then went on in your expert report in Exhibit 2 to state that the same ATSDR standard governs your analysis and that you agree with the ATSDR's approach and employ the same in your review; is that correct?

A. Correct.

MS. KONSTANTOPOULOS: We will now be marking the ATSDR Assessment of Evidence from 2017 as Exhibit 5.

(Document marked for identification as Culp Exhibit 5.)

BY MS. KONSTANTOPOULOS:

Q. Dr. Frank Bove performed ATSDR

systematic review of four chemicals and 16 health outcomes as a part of Exhibit 5 of the ATSDR Assessment of the Evidence report; correct?

A. Correct.

Q. And he completed this report by himself; isn't that true?

A. I -- I am not sure. I don't know.

Q. Can you check to see if he's listed as the only author?

A. You know where that is? (Laugh).

Q. Yeah.

A. I mean, if he listed himself and said he did it, I have to defer to his -- him. I'm not -- I don't have any knowledge of whether he did this alone or by -- with other people. So.

Q. You agree that the 2007 ATSDR assessment, Exhibit 5, did not use significance testing to assess evidence for causality; correct?

A. Correct.

Q. Instead, it looked at the ratio of the upper end of the confidence interval to the lower end.

Is that your understanding?

A. That's my understanding.

Q. Have you used this confidence interval ratio concept in your published studies before?

A. As part of my published studies, there have been conclusions made, again, not necessarily on the primary hypothesis, but on other factors that were discovered in the study, where a finding was not significant, but there was a positive or negative association that I concluded that could be real.

Q. Okay. And what you have used in your publications, is it fair to say that you're referring to confidence intervals?

A. Correct. Not -- well, not -- not significant based on a P-value and confidence intervals would be, you know, obviously crossing the null hypothesis with a 1, 1.0.

Q. Have you ever used a confidence -- something called a confidence interval ratio in your publications in the past?

A. I have not.

Q. In the ATR Assessment of Evidence, it states that a confidence interval ratio equal to or less than 2 indicates good precision; is

that correct? Is that your recollection?
A. Yes.
MR. WALLACE: Objection.
BY MS. KONSTANTOPOULOS:
Q. And I'm referring to page 8 of the report if you'd like to refresh your recollection. And by "the report" I mean Exhibit 5.
A. (Reviews document.)
Q. The ATSDR Assessment of the Evidence uses equipoise and above to describe the state of the evidence with respect to the relationship between some chemicals and diseases; correct?
A. Correct.
Q. In the past, you've never used that phrase to describe scientific evidence in an article that you published; correct?
A. I have not.
Q. Have you ever used the category -- categorization scheme sufficient evidence for causation, equipoise and above evidence for causation, and below equipoise evidence for causation in any specific article that you've written?
A. No.

MR. WALLACE: Objection.

BY MS. KONSTANTOPOULOS:

Q. Other than the 2017 ATSDR Assessment of the Evidence and the other studies authored by Frank Bove listed in your expert report, was the "equipoise and above" standard used in any of the other epidemiological literature that you reviewed in your expert report?

A. To my knowledge, no.

Q. Are you familiar with the National Research Council of the National Academics, otherwise known as NRC?

A. Vaguely.

Q. Are you familiar with David Savitz, Dr. David Savitz, an epidemiologist?

A. I -- I've read some, you know, not -- not specific, but I know he's involved in the case.

Q. Would you agree that Dr. Savitz is a highly respected -- highly respected in the field of epidemiology?

MR. WALLACE: Objection.

THE WITNESS: I would assume.

BY MS. KONSTANTOPOULOS:

Q. Would you agree that statistical significance is a factor that you look at in evaluating a study?

A. It's one of the factors.

Q. And you performed statistical significance testing in your published works; correct?

A. Yes.

Q. And it's also important to analyze standard incidence rate -- standard incidence rate; correct?

MR. WALLACE: Objection.

THE WITNESS: It depends on the study.

BY MS. KONSTANTOPOULOS:

Q. What is a risk ratio?

A. A risk ratio is a ratio of development of a disease in those that are exposed over those that are not exposed. So if an exposure is related to development of that disease, then the risk ratio will be greater than 1. If it is directly protective, then it would be less than 1.

Q. Okay. Is risk ratio the same as

odds ratio?

A. No.

Q. What's the difference?

A. So risk ratio relative risk is usually with a prospective cohort, going forward in time. So you have two groups, one exposed, one not exposed. You evaluate them, look for the outcome, and then at the end you could say the risk of development of this disease is X over Y for exposed versus not exposed.

Odds ratio is typically used for retrospective studies. So you look at the outcome, like case control, and you say, well, these -- these you have bladder cancer versus no bladder cancer. You look at what they were exposed in the past.

So the -- if you want to be very correct, what the prospective study is you are exposed to X. Therefore, your risk of developing this disease is Y. For an odds ratio, it's you developed the disease. The odds that you were exposed to X was this.

Q. Thank you.

What level of increased risk

reflects a modest association?

A. I tend not to use adjectives when I look at point values. I use exact numbers. So let's say a relative risk of 1.1. I say there's a 10 percent -- well, the point estimate is 1.1, not necessarily the true point -- true point, but it's the point estimate. I say there's a 10 percent increased risk of developing the disease based on this exposure.

Mild versus moderate versus significant or severe, that's an adjective that I leave up to the individual.

Q. And by "the individual," who are you referring to?

A. Whoever wants to -- that's interpreting this study. I mean, for me, a 10 percent risk increase is significant but may not be for somebody else.

Q. And by "somebody else" you mean another epidemiologist who's reviewing --

A. Another --

Q. -- the same results?

A. Another epidemiologist, another doctor, whoever.

Q. Is there any published literature that you're aware of that indicates that a risk ratio of 1.1 establishes a significant association?

A. Well, it depends on the -- the --I mean, if it's significant, it's significant. You're 95 percent sure based on your confidence intervals that your true estimate is above 1. So there is increased risk. Whether or not it's 10 percent, 20 percent, you're not sure, but that depends on your confidence interval.

The only thing you can say for sure is you can be 95 percent sure that the true estimate is above 1 and it's within that confidence interval. You don't know exactly what it is. You never will. But then there's obviously a 5 percent chance you're wrong as well.

Q. Are you aware that the EPA has categorized an odds ratio between 1.0 and 1.3 as evidence of a slight positive association?

MR. WALLACE: Objection.

THE WITNESS: I'm aware they did that, yes.

BY MS. KONSTANTOPOULOS:

Q. But you don't agree with that categorization?

A. Again, I don't like the use of adjectives. I like exact reliance on the data and what the data tells you.

Q. You're familiar with confidence intervals; correct?

A. Yes.

Q. Have you published studies that include a confidence interval to measure the precise -- the precision of results?

A. They're included in all my studies as one of the factors, including the P-value.

Q. Do you consistently use the same confidence intervals in your research applications?

MR. WALLACE: Objection.

BY MS. KONSTANTOPOULOS:

Q. Let me rephrase.

Do you consistently use the same confidence intervals in your research publications?

MR. WALLACE: Objection.

THE WITNESS: I always use 95

percent confidence interval, yes.

BY MS. KONSTANTOPOULOS:

Q. When the confidence interval includes a value of 1, you agree that increased risk results are not statistically significant; correct?

A. If -- if the study is set up to use a P-value of .05 and it's a double-sided, it's a two-sided system with an appropriate bell curve population. If it crosses 1, then it's like -- it's like not significant from a P-value, but that doesn't necessarily mean that the true estimate is above 1.

Q. Would you --

A. You just can't say with 95 percent confidence that it is above 1.

Q. Would you agree that a wider confidence interval weakens confidence that the risk estimate is accurate?

A. Risk estimate is always going to be within the confidence interval from a 95 percent standpoint. Whether or not you just -- it just could be further out to the right or further out to the left, the confidence intervals are tight,

but it doesn't change the validity of the risk estimate.

Q. So you would agree that the tighter the confidence interval, the more precision there is?

A. At knowing the true point estimate. Correct.

Q. Would you agree that a confidence interval of 0.9 to 1.1 is precise?

A. I wouldn't use the word "precise." I wouldn't even put an adjective on it, to be honest.

Q. Why not?

A. I mean, what is precise? I mean, it's tighter, I mean, as opposed to what? .8 to 1.2, it's tighter. I can say that.

Q. In comparison, you would agree that a confidence interval of 0.1 to 10.0 is more imprecise; correct?

A. Again, I wouldn't use the word "precise." I would -- I mean, your true estimate is still there. It's just that it could be further along to the right, further along to the left.

Q. What terminology would you use in evaluating the strength of a confidence interval?

A. I don't -- I don't use any adjective, really. I mean, the confidence interval is a confidence interval. It is what it is.

Q. Do you consider confidence intervals in determining what studies you relied upon in your report?

A. Yeah. I mean, confidence intervals are important because, again, it -- it shows the power of the study, number one. So the more power the study has, the less the confidence interval will be. The less power you have, the wider the confidence interval is.

So, yeah, you look at confidence intervals and you know -- I mean, your point estimate is your point estimate, but you know that doesn't -- that's not the real estimate. Well, that's not the real number. It's just an estimate based on the confidence interval.

Q. Would you agree that when the odds ratio increases as exposure increases, we can be more confident that an association is present?

MR. WALLACE: Objection.

THE WITNESS: If the odds ratio -- yes, I mean, that's strength of association. So a higher an odds ratio a relative risk is, the more confident you could be that causal association exists.

BY MS. KONSTANTOPOULOS:

Q. Is what I just described called a monotonic dose-response?

A. Monotonic dose-response means that there is a -- based on dose-response levels of exposure, that there's a not necessarily linear -- it can be curvilinear -- more positive response to the exposure.

Q. And you'd agree that we would typically expect to see a dose-response if there is causation; correct?

A. It depends. If the exposure is binary -- I was exposed, I was not, it doesn't matter what level -- I wouldn't expect to see a monotonic relationship. If -- but then, again, with a chemical where more exposure leads to more disease occurrence, then, yes, I would expect a dose-response of some sort.

Q. Moving on, according to your report, you summarize studies you deem to be relevant in determining whether PCE, TCE, or benzene had a causal relationship to bladder cancer; correct?

A. Correct.

Q. And you included a brief discussion of those studies' strengths and weaknesses; correct?

A. Correct.

Q. And then to determine whether there was a causal relationship between bladder cancer and these chemicals, you reviewed the literature to determine whether there was an association between bladder cancer and exposure; is that correct?

A. Yes.

Q. And once you confirmed an association, you used Bradford Hill factors to determine whether a causal relationship exists; is that right?

A. Correct.

Q. You indicate on page 4 of your expert report, Exhibit 2, that:

"Toxicology studies are particularly

relevant to certain of the Bradford Hill factors. As such, my review of those factors relies on the general causation reports submitted by the bladder cancer toxicology experts which I have reviewed as referenced in my Bradford Hill analysis."

Did I read that correctly?

A. Yes.

Q. So is it fair to say you did not analyze all of the Bradford Hill factors to make your determination, that some Bradford Hill factors -- let me rephrase.

You relied on other expert witnesses to analyze other Bradford Hill factors -- some of the Bradford Hill factors; correct?

MR. WALLACE: Objection.

THE WITNESS: I treated the Bradford Hill as a tool, a melting pot of sorts. So my interpretation of the Bradford Hill analysis was that each one of these 9 factors contributes to the overall kind of melting pot conclusion.

In terms of the toxicologists, since I do -- I am not an expert in toxicology, I relied on their reports and

their analysis to support coherence within the Bradford Hill analysis to give support that there is a causal relationship between exposure to these chemicals and bladder cancer, but not as a replacement of my own opinion. It was mainly as support for that one and the plausibility as well.

BY MS. KONSTANTOPOULOS:

Q. Thank you for the clarification.

So you relied upon the toxicology -- plaintiffs' toxicology experts' reports to establish coherence and -- what was the other one?

A. Plausibility.

Q. Plausibility.

Is that correct?

A. Correct.

Q. Moving on to Part D of your expert report, Exhibit 2, page 41.

You include section D entitled "PEOPLE WHO WORKED AND/OR LIVED AT MCB CAMP LEJEUNE BETWEEN 1953 AND 1987 WERE EXPOSED TO CONTAMINATED WATER THAT IS A CAUSE OF BLADDER CANCER."

Did I read that correctly?

A. I'm sorry. I'm trying to find. Page 41. Could you repeat the sentence?

Q. Sure.

This would be the title of section D. "PEOPLE WHO WORKED AND/OR LIVED --

A. Oh, yeah.

Q. -- AT MCB CAMP LEJEUNE --

A. Sorry.

Q. -- BETWEEN 1953 AND 1987 WERE EXPOSED TO CONTAMINATED WATER THAT IS A CAUSE OF BLADDER CANCER."

A. Correct.

Q. Thank you.

The first study you discuss under this section is the 2014 Bove study entitled "Evaluation of mortality among marines and navy personnel exposed to contaminated drinking water at USMC base Camp Lejeune: a retrospective cohort study"; correct?

A. Correct.

Q. Moving forward, I'm going to refer to this study as the 2014 Bove Marine study.

A. Agree.

Q. Do you understand?
A. Agree.
Q. Okay. Because it's a mouthful.
The 2014 Bove Marine study was a retrospective cohort mortality study of Navy and Marine Corps personnel who began military service between April 1975 and December 1985 that were stationed at Camp Lejeune or Camp Pendleton during that period; is that correct?
A. Yes.
Q. You agree that you stated in your report that the 2014 Bove Marine study concluded that the Camp Lejeune cohort did not have an excess risk of bladder cancer mortality; correct?
A. Correct.
Q. The second study you cited to in section D of Exhibit 2 was the 2014 study entitled -- by Bove entitled "Mortality study of civilian employees exposed to contaminated drinking water at UMC Base Camp Lejeune: a retrospective cohort study."
Did I read that correctly?
A. Yes.
Q. Moving forward, I'm going to refer

to the study as the 2014 Bove civilian study.

Do you understand?

A. Agree.

Q. This was a retrospective mortality study of full-time civilian employees at Camp Lejeune and Camp Pendleton; correct?

A. Correct.

Q. And you agree that the 2014 Bove civilian study concluded that the Camp Lejeune cohort did not have an excess risk of bladder cancer mortality; correct?

A. Correct.

Q. The third study you cited to in section D of your expert report in Exhibit 2 was the 2018 Bove study entitled "ATSDR, Morbidity Study of Former Marines, Employees, and Dependents Potentially Exposed to Contaminated Drinking Water At U.S. Marine Corps Base Camp Lejeune, April 2018."

Did I read that correctly?

A. Yes.

Q. I'm going to refer to the study moving forward as the 2018 ATSDR morbidity study.

Do you understand?

A. Yes.
Q. In your analysis of this study on your expert report on page 42, you stated that in 2018, ATSDR conducted a retrospective cohort morbidity study of Camp Lejeune Marines and civilian employees and Camp Pendleton Marines and civilian employees.
Is that right so far?
A. Yes.
Q. You indicated in your report that:
"Water distribution system models and ground water contamination fate and transport models were used to determine individual contaminant exposure."
Correct?
A. Correct.
Q. You would agree that you are not an expert in water modeling; correct?
A. I would agree.
Q. Okay. The 2018 ATSDR morbidity study focused on the effect of PCE or TCE on bladder cancer; correct?
MR. WALLACE: Objection.
THE WITNESS: Is that the

2018? To my knowledge, yes.

BY MS. KONSTANTOPOULOS:

Q. It did not -- the 2018 ATSDR morbidity study did not address benzene; isn't that true?

A. To my knowledge, correct.

Q. You indicated in your report that the 2018 ATSDR morbidity study did not find an excess risk of bladder morbidity in Camp Lejeune civilians relevant to Camp Pendleton civilians for either PCE or TCE; isn't that correct?

A. Correct.

Q. However, you indicated that Marines from Camp Lejeune had an excess risk of bladder cancer morbidity when compared to Camp Pendleton Marines; is that correct?

A. Yes.

Q. You indicated that Marines had an odds ratio equal to 1.64; is that right?

A. Yes.

Q. You would agree that this value only -- strike that.

MS. KONSTANTOPOULOS: I am going to mark the 2018 ATSDR morbidity

study as Exhibit 6.

(Document marked for identification as Culp Exhibit 6.)

BY MS. KONSTANTOPOULOS:

Q. I'm going to point your attention to page 80 of Exhibit 6.

I'm referring to Table 10 entitled "Odds ratios for internal analyses of cumulative exposure to TC" -- I'm sorry.

A. Table 9. Page 80.

Q. Oh.

So in Exhibit 6 page 82, Table 10.

A. Okay.

Q. I'd like to point your attention to the table entitled "Odd ratios for internal analyses of cumulative exposure to PCE among Camp Lejeune Marines."

You would agree that the bladder cancer -- that the bladder odds ratio for medium PCE exposure is 0.99; is that correct?

A. Yes.

Q. And for high exposure in Table 10, the odds ratio is 1.54; is that correct?

A. Correct.

Q. Now I'm going to ask you to go to page 80 Table 9 of Exhibit 6 entitled "Odds ratios for internal analyses of cumulative exposure to TCE among Camp Lejeune Marines."

MR. WALLACE: I'm sorry, counsel. You're on Table 9?

MS. KONSTANTOPOULOS: Correct.

MR. WALLACE: Thank you.

BY MS. KONSTANTOPOULOS:

Q. So in Exhibit 6, page 80, Table 9 entitled "Odds ratios for internal analyses of cumulative exposure to TCE among Camp Lejeune Marines," you would agree that the bladder cancer odds ratio for high TCE exposure is 0.74; correct?

A. Correct.

Q. And you would, therefore, agree that there was no excess risk of bladder cancer morbidity found for civilian personnel related to TCE; correct?

A. That's -- this is looking at Marines.

Q. Correct.

But based on the odds ratio value for TCE exposure of 0.74, you would agree that

there was no excess risk of bladder cancer morbidity related to TCE?

A. For Marines on this table.

MR. WALLACE: Objection.

BY MS. KONSTANTOPOULOS:

Q. Okay.

A. Yes. Based on these numbers, yes.

Q. Okay.

A. Or association was not found.

Q. Okay. You're aware that selection bias was a significant limitation of this 2018 ATSDR morbidity study; correct?

A. Please clarify.

Q. You're aware that selection bias was a limitation of this study because those at Camp Lejeune with health problems would be more likely to return a survey due to the publicity around the Camp Lejeune water contamination than those at Camp Pendleton with health problems; is that correct?

A. If that is true, then, yes, selection bias could exist.

Q. Okay. All right. Moving on, the next study that you reviewed in your expert report

in section D was the 2024 ATSDR mortality study for Camp Lejeune that you reference in your expert report; is that correct?

A. Correct.

Q. And you're familiar with this study?

A. This is a Bove study?

Q. The 2024 --

A. 2024.

Q. -- ATSDR mortality study for Camp Lejeune, which I will mark as Exhibit 7.

(Document marked for identification as Culp Exhibit 7.)

THE WITNESS: Yes.

BY MS. KONSTANTOPOULOS:

Q. Exhibit 7 compares the standard mortality rates of disease in the Camp Lejeune and Camp Pendleton populations adjusted for sex, race, and age in five-year increments; is that correct?

A. Correct.

Q. For urinary bladder cancer, you agree that the standard mortality ratio for the Camp Lejeune cohort was 0.97; is that correct?

A. Yes.

Q. And the result shows that adjusted

for sex, race, and age, there is a 3 percent -- there are 3 percent fewer deaths from bladder cancer in the Camp Lejeune cohort than the cohort for Camp Pendleton; correct?

A. Correct.

Q. And I want you to please flip to Table S6 entitled "Supplemental Materials" in Exhibit 6.

A. 6 or 7?

Q. It would be Table S6 of Exhibit 7. So Exhibit 7.

A. What page?

Q. There is no page numbers, but it should be the --

A. Table --

Q. -- the document after the -- do you see the tables at the back?

A. Yeah.

Q. Okay.

A. Table which one?

Q. So directing your attention to Table S6.

A. S6. Okay.

Okay.

Q. For bladder cancer, you would agree there is not a monotonic dose-response relationship, is there?

MR. WALLACE: Objection.

THE WITNESS:

(Reviews document.)

Based on this data, it does not appear that way.

MS. KONSTANTOPOULOS: Thank you.

I am now marking the Bove 2024 Cancer Incidence Study preprint as Exhibit 8.

(Document marked for identification as Culp Exhibit 8.)

BY MS. KONSTANTOPOULOS:

Q. Are you familiar with the Bove 2024 Cancer Incidence Study preprint -- preprint?

A. Yes.

Q. Are you aware that the preprint study did not show -- thank you.

I want to direct your attention to Table 2 of Exhibit 8.

You are familiar with this document.

So you've seen it before; correct?

A. Correct.

MR. WALLACE: Counsel, are you referring to the page with the last three Bates number digits of 148 in the bottom right-hand corner?

MS. KONSTANTOPOULOS: That's correct.

BY MS. KONSTANTOPOULOS:

Q. This table, Table 2 of Exhibit 8, shows the standard incidence rates and Poisson regression table for various diseases; correct?

A. Correct.

Q. And this compares the standard incidence rates of disease in the Camp Lejeune and Camp Pendleton populations adjusted for sex, race, and age in five-year increments; is that correct?

A. Correct.

Q. Okay. You would agree that for urinary bladder cancer -- excuse me.

You would agree for urinary bladder cancer, the standard incidence rate for the Camp Lejeune cohort is 0.90; is that correct?

A. Correct.

Q. This result shows that adjusted for sex, race, and age, there are 10 percent fewer bladder cancers in the Camp Lejeune cohort than the Camp Pendleton cohort; is that correct?

MR. WALLACE: Objection.

THE WITNESS: Based on the numbers, yes.

BY MS. KONSTANTOPOULOS:

Q. Would you agree that the confidence interval here is narrow?

A. Is I'm sorry?

Q. Would you agree that in this table that the confidence -- in Table 2 of Exhibit 8 that the confidence interval noted for bladder cancer is narrow?

A. I would say the confidence interval is .82 to .99. Again, I don't use adjectives.

Q. Thank you.

The result in Table 2 does not reflect a strong association between exposure to contaminants at Camp Lejeune and bladder cancer; correct?

MR. WALLACE: Objection.

THE WITNESS: Relative risk

based on if there's no significant association seen, but it doesn't -- there is a positive. And when they look at relative risk, it is a positive association, but it's not statistically significant.

BY MS. KONSTANTOPOULOS:

Q. Okay. I will now move on to the 2024 ATSDR mortality study for Camp Lejeune, which we will be marking as Exhibit 9.

You're familiar with the study; correct?

A. Yes.

Q. Do you recall the findings of the 2024 ATSDR mortality study for Camp Lejeune?

A. I'd like to see it to refresh my memories.

MS. KONSTANTOPOULOS: Fair enough.

Perhaps right now is a good time for a break. Counsel, is that all right?

MR. WALLACE: This is a good time.

MS. KONSTANTOPOULOS: Thank you.

THE VIDEOGRAPHER: The time is 11:34 AM. We're going off the record.

(A recess was taken.)

(Zina Bash entered Zoom.)

THE VIDEOGRAPHER: The time is 11:52 AM. We're going back on the record. Please proceed, counsel.

MS. KONSTANTOPOULOS: Thank you.

To clarify, I referenced the Bove 2014 mortality study. That's already been marked as Exhibit Number 7 -- 6. Excuse me.

MR. WALLACE: I'm sorry. When you say you referenced it, you already -- you -- can you explain what you mean?

MS. KONSTANTOPOULOS: Before the break --

MR. WALLACE: Okay.

MS. KONSTANTOPOULOS: -- I referenced marking Bove's 2024 mortality study as a new exhibit.

MR. WALLACE: Okay.
MS. KONSTANTOPOULOS: It was already marked as an exhibit --
MR. WALLACE: Got you.
MS. KONSTANTOPOULOS: -- and that was Exhibit 6.
THE WITNESS: 7.
MR. WALLACE: 6? 6 is the 2018 morbidity study.
MS. KONSTANTOPOULOS: Okay. Exhibit 7.
MR. WALLACE: Okay. 7 is the mortality table. That was the preprint. I'm sorry. Sorry. Exhibit 8 is the preprint. 7 is the 2024 mortality. Okay. Go ahead.
MS. KONSTANTOPOULOS: That is correct. Thank you.
MR. WALLACE: All right.

BY MS. KONSTANTOPOULOS:

Q. All right. I'm going to direct your attention back to Exhibit 6, the Bove ATSDR 2018 morbidity study, and I'm going to direct your attention again to page 82, Table 10 entitled

"Odds ratios for internal analyses of cumulative exposure to PCE among Camp Lejeune Marines."

Under bladder cancer, you would agree that there is a confidence interval for high exposure of 0.99 to 2.41; correct?

A. Yes.

Q. And you would agree that is not a statistically significant -- significant confidence interval; correct?

A. Correct.

MS. KONSTANTOPOULOS: Now, moving on, I am marking as Exhibit 9 the 2024 Bove Cancer Incidence Study.

(Document marked for identification as Culp Exhibit 9.)

BY MS. KONSTANTOPOULOS:

Q. This is a follow-up incidence study to the 2018 ATSDR study we previously discussed; correct?

A. Correct.

Q. You agree that follow-up studies are generally more accurate because of the ability to study a population for a greater length of time; correct?

A. With -- yes, with certain diseases. Correct.

Q. And that's especially true for bladder cancer because of the latency period associated with it; correct?

A. Correct.

Q. And indeed you stated on Exhibit 2, your expert report, page 11 that:

"Bladder cancer typically develops decades after risk exposure. For example, some researchers have observed a latency period of up to 40 years between carcinogen exposure and cancer diagnosis."

Does that sound correct?

A. Yes.

Q. Going back to Exhibit 9, the 2024 Bove Cancer Incidence Study, I would ask that you turn to Table 6.

Do you see urinary bladder listed?

A. Yes.

Q. You would agree that for urinary bladder cancer, there is not a monotonic dose-response relationship; correct?

A. Not based on these numbers, no.

Q. Would you agree that exposure-response analysis does not support an inference of causation between Camp Lejeune water contamination and urinary bladder cancer, does it?

MR. WALLACE: Objection.

THE WITNESS: Please rephrase the question or repeat the question.

BY MS. KONSTANTOPOULOS:

Q. Okay. That the findings in Table 6 of Exhibit 9 do not support an inference of increased incidence of bladder cancer in the Camp Lejeune cohort; correct?

MR. WALLACE: Objection.

THE WITNESS: There is -- based on the numbers, there is a positive association. Although not significant, there is a positive association in the different types. Or the codes they used to identify bladder cancer in the population, there is a positive association.

BY MS. KONSTANTOPOULOS:

Q. I'm going to point your attention back to your expert report, Exhibit 2, on page 44.

You indicated that the 2024 Bove incidence study did not yield statistically significant results; isn't that correct?

A. Correct.

Q. In your Bradford Hill analysis of Bove's cohort studies under section D of your report in Exhibit 2 on page 44, you also indicate:

"Epidemiological studies support an association between bladder cancer risk and exposure to PCE, TCE, and/or benzene."

Did I read that correctly?

A. Yes.

Q. You would agree that this is a typo, though, because benzene was not evaluated in these studies, only PCE and TCE; isn't that correct?

MR. WALLACE: Objection.

THE WITNESS: In the -- in the other studies besides the Bove study. Is that what you're asking?

BY MS. KONSTANTOPOULOS:

Q. In the studies listed in section D of your expert report in Exhibit 2, you would agree those studies focused only on PCE and TCE; isn't that correct?

A. I don't understand the question.

The Bove studies are not or is looking at the exposure -- is it the Bove studies or the other studies?

Q. So I'm referring -- and I can list the studies for you in section D.

In section D of your expert report entitled "PEOPLE WHO WORKED AND/OR LIVED AT MCB CAMP LEJEUNE BETWEEN 1953 AND 1997 WERE EXPOSED TO CONTAMINATED WATER THAT IS A CAUSE OF BLADDER CANCER."

You listed a number of studies in this specific section and those studies were studies by Frank Bove. The first being the 2024 Bove mortality study among Marines. The 2024 mortality study for civilian employees on page 42.

So far is that correct?

A. Yes.

Q. And in addition, in section D of your expert report, Exhibit 2, you analyzed the 2018 ATSDR morbidity study; correct?

A. Correct.

Q. You also analyzed on page 42 the 2024 evaluation of mortality among Navy personnel

and civilian workers; correct?

A. Correct.

So the exposure in all these studies was the exposure to the contaminated water. That could include PCE, TCE, as well as benzene. There's no way to go down to individual chemicals. You're exposed to the water. Whatever concentrations are in the water of each element you can't know.

So I would disagree with that. That benzene can be included if it was a contaminant in the water.

Q. You would agree, though, that the table attached, for example, to the 2024 incidence study in Exhibit 9 only analyzed specifically PCE, TCE, or cumulative exposure; correct?

MR. WALLACE: I'm sorry. What page?

THE WITNESS: I don't see that. I don't see where that is mentioned.

They're looking at exposure at Camp Lejeune versus exposure or no exposure at Camp Pendleton, but it

doesn't highlight specific chemicals.
BY MS. KONSTANTOPOULOS:
Q. Would you agree that the studies you referenced in section D of your expert report, Exhibit 2, does not specifically analyze confidence intervals and odds ratios or risk ratios related specifically to benzene?
A. I agree that it's not specific to benzene. It's specific to exposure to contaminated water. You can't -- I can't tell you. It's a combination of chemicals.
Q. All right. Moving on, earlier you indicated that you are familiar with IARC; correct?
A. Yes.
Q. Okay. In your expert report, Exhibit 2, on pages 11 to 12, you indicated that "PCE has been found to be probably carcinogenic to humans by IARC Group 2A"; isn't that correct?
A. Correct.
Q. And you cited to IARC 2014; is that right?
A. Correct.
Q. And you would agree that one of

IARC's primary roles is to conduct and coordinate international cancer research; is that correct?

A. As they state, yes.

Q. Yeah. You're familiar with their work, as you stated; correct?

A. Yes.

Q. IARC convenes interdisciplinary working groups of expert scientists, toxicologists, epidemiologists, who survey the scientific literature for published data to assess the strength of evidence linking an agent to cancer risk; is that right?

A. Correct.

Q. IARC publishes monographs which classify agents into different groups based on their potential to cause cancer; is that right?

A. Yes.

Q. In 2014, IARC published a monograph on the evaluation of PCE, TCE, and other chlorinated agents; is that correct?

A. To my knowledge, yes.

Q. Although IARC -- the IARC report found a positive association for bladder cancer, it did not find sufficient evidence for causation

of bladder cancer in humans; is that correct?
As opposed to animals.
MR. WALLACE: Objection.
THE WITNESS: Of PCE?
BY MS. KONSTANTOPOULOS:
Q. Correct.
A. It was a meta-analysis that they used as their -- meta-analysis that they used was listed on page 12 that supported a probable causal relationship with PCE and bladder cancer in humans. The meta-analysis was performed on a human population, not an animal population.
Q. You would agree, though, that there was only limited evidence in humans for an excess of cancer of the urinary bladder in dry-cleaning workers that IARC focused on; is that correct?
A. That meta-analysis is part of their study or their review, yes, that was one meta-analysis.
MS. KONSTANTOPOULOS: Thank you for your patience.
I will be handing you what I will mark as Exhibit 10, which is a printout for the -- from the IARC website

titled "List of classifications by cancer sites with sufficient or limited evidence in humans, IARC Monographs Volumes 1-138a."

(Document marked for identification as Culp Exhibit 10.)

BY MS. KONSTANTOPOULOS:

Q. And earlier you stated that you are familiar with IARC monograms; correct?

A. That they exist, yes.

Q. I'm going to point your attention to page 9.

This is the table for bladder cancer; correct?

MR. WALLACE: Objection.

THE WITNESS: Correct.

BY MS. KONSTANTOPOULOS:

Q. You see that PCE is not listed among the "agents with sufficient evidence in humans" for bladder cancer; correct?

A. It's not listed in this table. Correct.

Q. You see that PCE is listed in the category of "Agents with limited evidence in

humans"; correct?

A. It is not listed in this table. Correct.

Q. Moving on, in your expert report, Exhibit 2, on page 12, you indicated that PCE has been found to be likely carcinogenic in humans by all routes of exposure by the EPA, and you cited to EPA 2011 in your report; is that correct?

A. Yes.

Q. Okay. I'd like to point your attention back to Exhibit 3, which was your reliance files.

Pointing your attention to page 8, you agree that you are citing -- we'll wait till you get there.

You agree that you are citing to an old EPA study regarding PCE; isn't that correct?

EPA 2011 is an old study regarding PCE?

MR. WALLACE: Objection.

THE WITNESS: It's before. Yes, I mean, it's published in 2011.

BY MS. KONSTANTOPOULOS:

Q. There is a more current version

available from December 2020 that you cite to in your reliance files in Exhibit 3; correct?

A. Correct.

Q. And that's entitled "Risk Evaluation for PCE" using the acronym; isn't that correct?

A. Correct.

Q. You would agree that more recent studies cited in the 2020 EPA risk evaluation indicate that new studies provide little support for an association between bladder cancer and PCE exposure; correct?

A. Do you have a copy I can review?

Q. Yes. That would help refresh your recollection, of course.

MS. KONSTANTOPOULOS: I'm going to mark as Exhibit 11 the EPA 2020 Risk Evaluation for PCE.

(Document marked for identification as Culp Exhibit 11.)

BY MS. KONSTANTOPOULOS:

Q. And I will point your attention to page 665.

MR. WALLACE: And just for the record, I'd like to reflect -- say that

Exhibit 11 is not a 714-page document. Is that correct?

MS. KONSTANTOPOULOS: Correct.

MR. WALLACE: Okay. All right. So Exhibit 11 just has excerpts of the 2020 Risk Evaluation for Perchloroethylene?

MS. KONSTANTOPOULOS: Yes. To be clear, the Exhibit 11 includes the cover page, the Table of Contents up until page 33, and then it also includes page 665 and 666.

BY MS. KONSTANTOPOULOS:

Q. Pointing your attention back to Exhibit 11, you would agree that under the second paragraph under bladder, it states that:

"More recent studies provide little support for an association between bladder cancer and PCE exposure."

Isn't that correct?

A. That's what it says, yes.

Q. Thank you.

Moving on to the Bradford Hill factors, you would agree that before one can

analyze the Bradford Hill criteria, the association must be more than merely observed, it must be clear-cut; correct?

A. It needs to be a positive association, yes.

Q. And in your Strength of association analysis for PCE in Exhibit 2, your expert report, on page 21, you indicated that a significant association between PCE and bladder cancer was found in multiple studies?

A. Correct.

Q. And you cited specific studies in your Bradford Hill analysis in your expert report to demonstrate strength of association; correct?

A. Correct.

Q. Directing your attention to page 14 of your expert report, Exhibit 2, I'm going to go over the first study that you cited in your Strength of association analysis for PCE.

That was the case of Brown and Kaplan from 1987; isn't that correct?

A. Correct.

Q. And in describing the Brown and Kaplan study, you indicated on page 14 of

Exhibit 2:

This is a cohort -- excuse me. This is a cohort study --

"This cohort study was conducted of 1,690 dry-cleaning workers exposed to PCE" and other chemicals "at least one year prior to 1960 and no known previous occupational exposure. Mortality was investigated through 1982. A sub-cohort was also designated to account for those workers who were knowingly only exposed to PCE."

Did I read that correctly?

A. Yes.

Q. In the second to last sentence of your analysis of the Brown and Kaplan study in your expert report, Exhibit 2, isn't it true that you admitted "when the PCE-only sub-cohort was reviewed, there was no excess risk in bladder cancer mortality"; correct?

A. No -- no excess risk was found when the sub-cohort was reviewed, but that could be due to less power to determine an association.

Q. And the results that you cited from this study to demonstrate strength of association

was limited only to the PCE-plus cohort; isn't that correct?

A. Correct.

Q. Workers from the PCE-plus sub-cohort worked in shops where PCE was confirmed but also in shops where solvents were a known; isn't that fair to say?

A. It's fair to say.

Q. The specific chemical exposure in the PCE-plus cohort here was unknown; is that true?

MR. WALLACE: Objection.

THE WITNESS: The totality -- I mean, that's true as far as it included everything, I mean, that they were exposed to.

BY MS. KONSTANTOPOULOS:

Q. The PCE-plus sub-cohort could have been exposed to PCE and another solvent or some mixture of multiple solvents; correct?

A. Correct.

Q. You would agree that the PCE sub-cohort had a wide confidence interval between 1.28 to 5.86?

A. That's the confidence interval, 1.28 to 5.86.

Q. You would agree that's a wide confidence interval?

A. No, I wouldn't. I wouldn't ascribe an adjective to a confidence interval.

Q. Okay. The second study that you cited to demonstrate strength of association between PCE and bladder cancer was the 1994 Ruder study on page 14 Exhibit 2 of your expert report; correct?

A. Correct.

Q. The Ruder study -- the 1994 Ruder study was an update to the 1987 Brown and Kaplan study we just discussed; correct?

A. Correct.

Q. In your strength of analysis -- Strength of association analysis, you again cited only to the PCE-plus cohort from the study; correct?

A. Correct.

Q. You would agree that there was no excess risk in bladder cancer mortality found in the PCE-only sub-cohort; correct?

A. No association was found. Correct.
Q. Would you agree that the PCE sub -- PCE-plus sub-cohort had a wide confidence interval between 1.61 to 6.68?
A. I would agree that there's 95 percent confidence that the true estimate lay between 1.61 to 6.68.
Q. Okay. Moving on to the 2001 Ruder study. This is the third study that you cited in Exhibit 2 page 14 to demonstrate strength of association between PCE and bladder cancer, which was an update to the 1994 Ruder study; correct?
A. Correct.
Q. I'm going to refer to the study as the Ruder update moving forward.
Do you understand?
A. Agree.
Q. Okay. Do you understand which --
Okay. In your Strength of association analysis, you again cited only to the PCE-plus sub-cohort from the Ruder -- in the Ruder update; correct?
A. Correct.
Q. You would agree that the Ruder

update did not find an excess risk in bladder cancer mortality in the PCE-only sub-cohort; correct?

A. Correct.

Q. Now, the fourth study that you cited to demonstrate strength of association between PCE and bladder cancer was the 2011 Calvert study entitled "Mortality and end-stage renal disease incidence among dry cleaning workers"; is that correct?

A. Yes.

Q. That is another follow-up to the Brown and Kaplan 1987 study; correct?

A. Correct.

Q. You indicated on page 21 of Exhibit 2 of your expert report that the Calvert study "found increased mortality for bladder cancer in those who worked in one or more dry-cleaning shops using PCE and those shops were -- where primary solvent could not be identified but likely was PCE"; is that correct?

A. Correct.

MS. KONSTANTOPOULOS: At this time I am marking the Calvert 2011 study

as Exhibit 12.

(Document marked for identification as Culp Exhibit 12.)

BY MS. KONSTANTOPOULOS:

Q. I'm going to ask you to turn to page 711 and look at Table 2 of Exhibit 12. Please then go to the second column, first paragraph.

You would agree that the Calvert study states:

"For several types of cancer, mortality was not significantly elevated" --

MR. WALLACE: I'm sorry, counsel, we're looking at Table 2, but you're reading from something. Where are you reading from?

MS. KONSTANTOPOULOS: Above -- in column 2 above Table 1 in the second -- the first full paragraph.

MR. WALLACE: First full. Beginning with "For several types"?

MS. KONSTANTOPOULOS: Exactly.

MR. WALLACE: Okay.

MS. KONSTANTOPOULOS: On page 711.

MR. WALLACE: Okay. I just want to make sure I'm reading the same thing you are. Go ahead.

MS. KONSTANTOPOULOS: Thank you.

BY MS. KONSTANTOPOULOS:

Q. You would agree that the Calvert study -- the authors of the Calvert study state:

"For several types of cancer, mortality was not significantly elevated in the overall cohort but was elevated in the PCE-plus subcohort."

That was the case in the study, correct, for bladder cancer?

A. Yes. I mean, that's what's stated, yes.

Q. There was no excess risk of bladder cancer mortality found in the PCE-only sub-cohort in the Calvert study; correct?

A. Correct.

Q. In your expert report on page 15, you noted several limitations of the Calvert study in Exhibit 2 of your expert report.

You stated:

"Because many work histories were unavailable after 1982, duration of exposure could be underestimated for some workers. Additionally, without job titles and personal exposure limits, underestimates of exposure duration and lack of data on exposure intensity may have biased the findings."

Did I read that correctly?

A. Yes.

Q. Another limitation you acknowledge in your expert report, Exhibit 2, on page 15 was that the Calvert study was unable to control for potential confounding from smoking or alcohol; correct?

A. Correct.

Q. You noted that because the author -- that the original authors of the 1987 study deemed this unlikely to confound, though; isn't that correct?

A. Correct.

Q. You would agree, though, that perhaps smoking might not have been a confounding factor back in 1987, smoking is a confounding factor when we are looking at a study today;

correct?

MR. WALLACE: Objection.

THE WITNESS: No. The only way it could be a confounding factor is if it's associated with either the exposure or the outcome separately.

If it is -- if there is no reason to think that one group is more likely to smoke than the other group, then it's nondifferential misclassification, which by definition leads to results towards the null. It does not inflate the point estimate.

BY MS. KONSTANTOPOULOS:

Q. Wouldn't it be a confounding factor in a study dealing with bladder cancer given that smoking is the biggest risk factor for bladder cancer?

A. No.

Q. Isn't it true that over 50 percent of bladder cancer deaths are attributable to smoking?

A. I'm not aware of that.

Q. The authors of the Calvert study

reported some additional limitations in the Calvert report, which was previously marked as Exhibit 12. If I can point your attention back to that study, page 714.

Under the heading entitled "Strengths and Limitations," you agree that the third limitation noted on page 714 of Exhibit 12 states:

"Third, some members of the PCE-plus subcohort were exposed to other dry cleaning solvents in addition to PCE. The identity of these solvents is unknown but they are thought most often to have been Stoddard solvents."

Did I read that correctly?

A. Yes.

Q. You agree that the authors of the Calvert study indicated that this was an additional limitation; correct?

A. Correct.

Q. Why do you think that was a limitation?

A. It's a limitation as far as their ability to -- I mean, again, when you're dealing with occupational exposure, it's more likely

you're going to be exposed to elements in addition to -- it's hard to tease out specific exposures. Not that you can't in some situations, but in this case they weren't able to do that. So it limited their ability to provide a stronger association between PCE itself and bladder cancer.

Q. You would agree that the highest quality evidence to assess an association between PCE and bladder cancer would come from studies that conducted a quantitative assessment of exposure to PCE only; correct?

MR. WALLACE: Objection.

THE WITNESS: In theory, yes, but the reality is it's very difficult to exclude -- I mean, based on the ability to -- I mean, you get into exposure misclassification because a lot of these studies have exposure misclassification.

And, again, when you have exposure misclassification, this likely leads to the null and lessens your ability to strengthen the association between PCE itself and bladder cancer.

BY MS. KONSTANTOPOULOS:

Q. Another study you cited to support strength of association for PCE was the Vlaanderen study entitled "PCE Exposure and Bladder Cancer Risk: A Meta-Analysis of Dry-Cleaning Worker Studies"; correct?

A. Correct.

MS. KONSTANTOPOULOS: I am marking the Vlaanderen study as Exhibit Number 13.

(Document marked for identification as Culp Exhibit 13.)

BY MS. KONSTANTOPOULOS:

Q. The Vlaanderen study is a cohort study; correct?

A. It's a meta-analysis.

Q. You would agree that the authors examined cohorts and other studies that examine risks among occupational groups rather than by levels of PCE; correct?

A. (Reviews document.)

Correct.

Q. You would also agree that after reviewing occupational exposure to PCE only, the Vlaanderen study did not find that exposure to PCE

resulted in increased risk of cancer; correct?

A. (Reviews document.)

MR. WALLACE: Objection.

THE WITNESS: They acknowledge that PCE was likely the primary solvent, but there could be other solvents involved.

BY MS. KONSTANTOPOULOS:

Q. I'm going to draw your attention to page 665 of Exhibit 13. The third sentence after the heading "Discussion."

You would agree that it states:

"However, we identified only three studies that estimated exposure to PCE specifically (Christensen et al. 2013; Lipworth et al. 2011; Pesch et al. 2000), none of which reported estimates of risk per unit of exposure to PCE."

Did I read that correctly?

A. Yes.

Q. Now moving on to another study for PCE that you included under dose-response, the Bradford Hill factor for dose-response.

You would agree that you noted the

2019 Callahan study in your expert report in Exhibit 2; correct?

A. Correct.

Q. This was also a study based on employment in a specific occupation, dry cleaners in St. Louis; correct?

A. Yes.

Q. And there was no measured dose data in this study, was there?

A. Not to my knowledge.

Q. And the authors observed an increase in bladder cancer mortality among dry-cleaning workers with PCE exposure; is that correct?

A. Correct.

Q. You would agree, though, that this was estimated based on only three deaths; correct?

A. If that's -- yeah, that's the number of deaths, yes.

Q. What convinced you that the association between PCE and bladder cancer was sufficiently clear-cut -- clear-cut to perform a Bradford Hill analysis here for PCE?

A. I wouldn't use the word "clear-cut." I just put the evidence into each factor for the

Bradford Hill analysis and based my opinion on that.

Q. For the Consistency factor on page 22 of Exhibit -- Exhibit 2, your expert report, you conclude:

"A significant association between PCE and bladder cancer was observed among multiple studies with unique cohorts."

Correct?

A. Correct.

Q. No studies are cited here under the Consistency factor in your expert report; correct?

A. Not -- not under Consistency, no.

Q. You would agree that there were numerous inconsistent studies that you reference in your PCE analysis generally; correct?

A. Not from the standpoint of consistently showing a positive association.

Q. I'm going to refer back to your expert report, Exhibit 2, looking at page 16, which is where you analyze the Boice 1999 study entitled "Mortality among aircraft manufacturing workers."

You stated in your expert report

that:

"This study did not find an increased risk of death from bladder cancer in workers at the aircraft manufacturing facility from exposure to PCE or other solvents used to dissolve grease and oil."

Did I read that correctly?

A. Correct. Yes.

Q. Now, you also analyzed the 2011 case of Lipworth on page 16 of your expert report in Exhibit 2; correct?

A. Correct.

Q. This study extends the Boice study and is entitled "Cancer mortality among aircraft manufacturing workers: an extended follow-up"; correct?

A. Correct.

Q. And in your analysis, you stated on page 16 of Exhibit 2:

"PCE-exposed employees did not experience an increased risk of bladder cancer mortality."

Correct?

A. Not based on their study and

results, correct.

Q. Okay. Moving on to page 17 of your expert report, Exhibit 2, you analyzed the 2014 Silver study entitled "Retrospective Cohort Study of a Microelectronics and Business Machine Facility."

A. Correct.

Q. On page 17 of your expert report, Exhibit 2, under the analysis for the Silver study, you stated that:

"This study did not show an increased risk of bladder cancer with exposure to PCE."

Correct?

A. Correct.

Q. Still on page 17, you analyzed the case authored by -- the study authored by Selden entitled "Cancer morbidity in Swedish dry-cleaners and laundry workers; historically retrospective cohort study" -- excuse me.

A. Prospective.

Q. Yes. Let me rephrase.

You cited the Selden study in 2011 entitled "Cancer morbidity in Swedish dry-cleaners

and laundry workers"; correct?

A. Correct.

Q. And you indicated that there was no significant increased risk of bladder -- there was no significant increased risk of bladder cancer; correct?

A. This study did not show an increased risk -- significant increased risk of bladder cancer. Correct.

Q. And on page 19, you analyzed the 2013 case authored by Christensen entitled "Risk of selective cancers due to occupational exposure to chlorinated solvents in a case-control study in Montreal."

Correct?

A. Correct.

Q. And in your report, you stated:

"The study found that neither substantial exposure nor any exposure to PCE resulted in an excess risk of bladder cancer when compared to populate -- population and cancer controls."

Correct?

A. The study did not show an

association. Correct.

Q. Okay. And on page 21, you also analyzed the 2014 Xie study entitled "Occupational exposure to organic solvents and risk of bladder cancer."

Correct?

A. Yes, correct.

Q. And you indicated that the study did not find an increased risk associated with whatever exposure of PCE and bladder cancer; correct?

A. Correct. Their analysis did not find an association.

Q. Under your analysis on page 22 of your expert report, Exhibit, 2 you state:

"While -- while specificity may support a finding of causal association, a lack of specificity does not negate it."

A. Correct.

Q. Other than stating this in your expert report, would you agree that there was no further analysis regarding specificity?

A. Please elaborate.

Q. That was the only analysis included

under the Bradford Hill factor Specificity in your expert report on page 22; correct?

A. Correct.

Q. Moving on to the Bradford Hill factor dose-response.

You cited to two studies here. The Calvert study and the Callahan study; is that correct?

A. Correct.

Q. Why did you choose these two studies?

A. These studies showed that dose-response did show basically the risk of a bladder cancer was increased in those who were exposed for longer.

Q. Did you find any studies that did not support dose-response and, if so, how did you justify not including them here in this discussion?

MR. WALLACE: Objection.

BY MS. KONSTANTOPOULOS:

Q. Let's start with the first question.

Did you find any studies that did not support dose-response?

A. There were studies that did not show a dose-response.

Q. And how did you justify not including them here in your discussion of dose-response in your expert report in Exhibit 2?

A. Because the studies did not show a significant on the counter -- on the reverse, they did not show a decreased dose that would counter a dose -- positive dose-response.

Q. In your PCE analysis, you cited to the study of the 2000 study of Pesch; isn't that correct?

A. Pesch?

(Reviews document.)

Yes.

Q. Okay. You would agree that the results of this study showed gender differences where women had the highest risk in the lowest exposure category, while men were borderline risk in the higher exposure group; correct?

A. I would have to review that study again.

(Reviews document.)

In my review, I noted that males

assessed according to the job task exposure matrix who were exposed to substantial PCE had a statistically significant odds ratio of 1.8 of urothelial cancer after adjusting for smoking, study center, and age.

Q. And did you report the findings of the women from that study in your analysis?

A. Not in my report, no.

Q. And both the Calvert and Callahan studies that you relied upon to demonstrate dose-response, those were both occupational studies; correct?

A. Correct.

Q. Those were studies based on occupational exposure; correct?

A. Correct.

Q. And you would agree that the Callahan study, that you noted that the Callahan study on page 22 of your expert report, Exhibit 2, indicates a confidence interval of 1.1 to 76.7?

A. Correct.

Q. You would agree that that's a wide confidence interval; correct?

A. It's wider.

Q. And the wider the confidence interval, the more unreliable the result is; isn't that correct?

A. No. All you could say for this is that the point estimate is 9.1 and you're 95 percent confident that the true estimate is between 1.1 and 76.7. It could be anywhere in there and then your 5 percent chance you don't have it right at all.

Q. Moving on to the Biological Plausibility standard for PCE that you reviewed for PCE in your expert report, Exhibit 2.

You indicated that the factor was satisfied by your review of general causation toxicology reports; is that correct?

A. Correct.

Q. So you didn't perform an independent analysis of this factor; correct?

A. No.

Q. Okay. Moving on to the Coherence factor under your Bradford Hill PCE analysis, you indicated:

"Based on epidemiology literature discussed herein and my review of the general

causation toxicology reports" you find it satisfied.

Correct?

A. Correct.

Q. And you did provide any further analysis on the Bradford Hill factor of Coherence in your expert report; correct?

A. Correct.

Q. Under Experimental Experience under Bradford Hill factors for PCE, you indicated that:

"Human experimental evidence is unavailable due to ethical considerations and animal experimental evidence is limited as it relates to this chemical exposure and bladder cancer."

Correct?

A. Correct.

Q. And there was no further analysis in your expert report in Exhibit 2 related to experimental evidence for PCE; is that correct?

A. Correct.

Q. You did not include an assessment of how you weigh the evidence or weigh these Bradford Hill factors; isn't that correct, in your expert

report?

MR. WALLACE: Objection.

THE WITNESS: As mentioned, I used kind of like a gestalt of the entire Bradford Hill analysis, not relying on one specific of these 9 factors. So that's how I came to my conclusions in my opinion.

BY MS. KONSTANTOPOULOS:

Q. Did you weigh the Hill considerations relative to each other?

MR. WALLACE: Objection.

THE WITNESS: Not -- not -- if -- if one was stronger than the other, if there was more data or more data behind strengthening one over the other, that -- that could be true, but it did not -- again, it was all taken into account, all 9 factors, and then my opinion based on that.

BY MS. KONSTANTOPOULOS:

Q. You would agree, though, that you did not include an assessment of how you weighed the evidence specifically in your expert report;

correct?

MR. WALLACE: Objection.

THE WITNESS: I mean, I weighed the evidence as a totality of all 9 factors.

BY MS. KONSTANTOPOULOS:

Q. You agree that on page 23 of your expert report, Exhibit 2, after going through the various Bradford Hill factors, you stated:

"Based on the review of the Bradford Hill factors above, I am satisfied to a reasonable degree of scientific certainty that a causal relationship between PCE exposure and bladder cancer exists and that PCE can be a cause for bladder cancer."

A. Correct.

Q. Correct?

And there was no other analysis contained in this section discussing how you weighed these factors; correct?

A. No. I mean, it was my review of the factors as all 9 factors.

MS. KONSTANTOPOULOS: Counsel, is right now a good time to take a break

for lunch?

MR. WALLACE: Yeah. Yes.

MS. KONSTANTOPOULOS: Okay. Thank you.

THE VIDEOGRAPHER: The time is 12:42 PM. We're going off the record.

(Whereupon, at 12:42 PM, a luncheon recess was taken.)

AFTERNOON SESSION

(1:35 PM)

STEPHEN H. CULP, MD, PHD

called for continued examination and, having been previously duly sworn, was examined and testified further as follows:

EXAMINATION (CONTINUED).

THE VIDEOGRAPHER: The time is 1:35 PM. We are going back on the record. Please proceed, counsel.

BY MS. KONSTANTOPOULOS:

Q. Going back to your expert report, Exhibit 2, section B, page 23, you agree that you indicate that "TCE EXPOSURE IS A CAUSE OF BLADDER CANCER IN HUMANS"; is that right?

A. I would agree that it can be a cause. Correct.

Q. And in your report, you state that:

"TCE has been determined to be carcinogenic to humans by IARC and carcinogenic in humans by all routes of exposure by the EPA 2011 and IARC 2014."

Is that correct?

A. Correct.

Q. Isn't it true that IARC classified TCE has being carcinogenic to humans based on sufficient epidemiological evidence for cancer of the kidney?

A. To my knowledge, correct. Yes.

Q. And the classification of TCE as carcinogenic to humans was not based on a finding of sufficient epidemiological evidence for bladder cancer; correct?

MR. WALLACE: Objection.

THE WITNESS: Not sufficient enough, correct, for bladder.

BY MS. KONSTANTOPOULOS:

Q. You further state on page 23 of your report that the EPA found TCE to be likely carcinogenic in humans by all routes of exposure; correct?

A. Correct.

Q. And you cite to the USEPA 2011 report?

A. Correct.

Q. Would you agree that the EPA's decision to characterize TCE as carcinogenic in humans by all routes of exposure was based on its

finding of evidence of causal association between TCE exposure in humans and kidney cancer?

A. I believe that's what it was related to. Correct.

Q. And let's go through the studies that you allege show a significant association between TCE and bladder cancer.

In section B of your expert report, Exhibit 2, under Strength of association, you include the study Morgan et al. from 1998 entitled "Mortality of aerospace workers exposed to TCE," which you claim found a significant increased risk of bladder cancer in the high cumulative exposure sub-cohort that you analyzed on page 26; is that correct?

A. Correct.

Q. This was a meta-analysis study; correct?

A. Correct.

Q. And the study includes a cohort of aerospace workers where approximately 23 percent of them were exposed to TCE; correct?

A. Correct.

Q. And this exposure to TCE was

estimated based on occupation; correct?

A. Correct.

Q. The study didn't calculate how much each individual was exposed to TCE; isn't that true?

A. That is true.

Q. And you agree that there were limitations in the study, which included limited follow-up time, small number of cancer mortality in the exposed and unexposed cohorts, lack of data on individual exposure and confounders, and no direct measure of individual solvent exposure?

A. Correct.

Q. Is that correct?

A. Yes.

Q. A major limitation in the study was that they did not adjust for smoking; isn't that true?

A. Correct.

Q. You also include the study from Hadkhale entitled "Occupational exposure to solvents and bladder cancer: A population-based control study in Nordic countries."

In your Strength of association

analysis under section B of Exhibit 2, you indicated that this case-control study on page 32 of Exhibit 2 found that high TCE exposure exposed subjects were -- you indicated that this case-control study found that high TCE-exposed subjects had an increased risk of bladder cancer; is that correct?

A. Correct.

Q. And that was based on a hazard ratio of 1.23?

A. Correct.

Q. The Hadkhale study did not control for smoking; isn't that true?

A. To my -- I don't mention it here, I don't believe, but to my knowledge, they did not.

Q. Okay. And the Hadkhale study assesses -- assessed the relationship between occupational exposure and multiple solvents, not just TCE; isn't that true?

A. That's true.

Q. And job exposure matrices for TCE exposure were used in this study; is that correct?

A. (Reviews document.)

Let me go back and see. To my

knowledge, yes, but let me look just check here.

(Reviews document.)

Quantitatively estimated based on the link between occupational codes and NOCCA-JEM -- N-O-C-C-A - J-E-M -- which was developed from the Finish job exposure metric. Correct.

Q. And the next study that you listed under your Strength of association analysis for TCE in section B of Exhibit 2, your expert report, was the 2019 Sciannameo case entitled "New insights on occupational exposure and bladder cancer risk: a pooled analysis of two Italian case-control studies"; is that correct?

A. Correct.

Q. You indicated that this study showed a non-statistical increased risk of bladder cancer; correct?

A. Correct.

Q. What does that mean?

A. It means there was a positive association, but there was -- the 95 percent or the statistical significance was not reached but, nonetheless, a positive association was noted.

Q. And this study also used a job exposure matrix to assign exposures to the study population; correct?

A. Occupational carcinogenicity exposure, correct.

Q. Isn't it true that those that were considered to be highly exposed had slightly excess risk, but those with low TCE exposure had the greatest risk in this study; correct?

A. Based on the results, correct, but that could be due to, you know, misclassification or the number. I don't know the number of subjects in each of the groups, but if the highly exposed persons -- I don't know if you have a copy of that study -- was the lower number, then they might have had a lower power to evaluate that.

Q. The highly exposed persons in this study had an odds ratio of only 1.08; isn't that correct?

A. That is correct.

Q. The next study that you cite to for strength of association for TCE in section B of your expert report, Exhibit 2, was the case authored by Mallin entitled "Investigation of a

bladder cancer cluster in northwestern Illinois"; is that correct?

A. Correct.

Q. And was this an ecological study?

A. Let me find it in my report here. Let's see.

Thank you for your patience.

Q. Thank you for your patience.

A. (Reviews document).

Q. Would you like me to point where you discuss --

A. Yeah, I can't find it.

Q. -- it in your expert report?

A. Yeah, that would be great. Thank you.

Q. It appears that you discuss Mallin in the PCE section, not the TCE section.

A. It could be a formatting issue. I apologize.

Yes.

Q. On page 15 of your expert report, Exhibit 2?

A. Correct.

Yeah. So this is obviously looking

at -- the study looking at when they were evaluating overall cancer incidence found that there was an unexpected elevation of cancer within this community. So they looked at 8 counties within the area relying on zip codes and that showed elevated bladder cancer incidence.

And they found that both tetrachloroethylene and trichloroethylene were present into the wells located within these zip codes.

Q. In addition to PCE and TCE being found in two wells located within about a half a mile of a landfill, there were also demonstrated traces of other multiple solvents; isn't that correct?

A. Correct.

Q. Is there a known dose relationship -- excuse me.

Is there a known dose-response relationship found in the study?

A. Not to my knowledge.

Q. And there's no information in the study about individual exposure levels -- levels?

A. No.

Q. And since this was an ecological study, there was no assessment of confounding variables; correct?

A. Correct.

Q. You're aware that the authors of this study wrote that a more detailed study would need to be done, including personal interviews; right?

A. Correct.

Q. Are you aware of any subsequent publications?

A. Not to my knowledge.

Q. Okay. For Consistency, on page 32 of your expert report, Exhibit 2 -- 30 -- Exhibit 2, you stated:

"Multiple studies with unique cohorts found an increased but not significant risk of bladder cancer in those exposed to TCE."

Did I read that correctly?

A. Correct.

Q. And this differs from your opinion of TCE; isn't that correct, slightly?

MR. WALLACE: Objection.

THE WITNESS: PCE. Should be

PCE or TCE?

BY MS. KONSTANTOPOULOS:

Q. Let me restate that. Thank you.

A. (Laugh).

Q. You would agree that your conclusion on page 32 for TCE, which states that "Multiple studies with unique cohorts found an increased but not significant risk of bladder cancer in those exposed to TCE," is slightly different than your conclusion for PCE; correct?

A. Correct.

Q. You would also agree that there were cases that you analyzed that did not demonstrate strength of association between TCE and bladder cancer that you said in your report; correct?

A. Correct.

Q. And I'll point your attention to page 24 to page 25 of your expert report, Exhibit 2.

Here you cite to the Blair study from 1998 entitled "Mortality and cancer incidence of aircraft maintenance workers exposed to TCE and other organic solvents and chemicals"; is that correct?

A. Correct.

Q. On page 25, you indicated that:

"The female subcohort had only one bladder cancer death and two bladder cancer diagnoses, leaving the study underpowered to detect an association between occupational TCE exposure and risk of bladder cancer in women"; correct?

A. Correct.

Q. You also cited to the 1991 Radican study entitled "Mortality of aircraft maintenance workers exposed to TCE and other hydrocarbons and chemicals: extended follow-up"; correct?

A. Correct.

Q. And on page 25 of Exhibit 2, under the analysis for that report, you indicated that TCE exposure does not result in excess bladder cancer mortality; correct?

A. Correct.

Q. You also cited to the Axelson -- Axelson 1994 study entitled "Updated and expanded Swedish cohort study on TCE and cancer risk"; correct?

A. Correct.

Q. And on page 25 of Exhibit 2 of your expert report under the analysis of the Axelson study, you stated that "TCE exposure did not result in a significant increase in bladder cancer morbidity"; correct?

A. Correct.

Q. You also studied -- cited to the 1999 Boice study entitled "Mortality among aircraft manufacturing workers" on page 27 of your expert report, Exhibit 2; correct?

A. Correct.

Q. And on page 27 of your expert report in Exhibit 2, you stated:

"Those routinely exposed to TCE did not experience an excess of bladder cancer mortality."

Correct?

A. Based on the results, they did not find an increased risk --

Q. Okay.

A. -- for mortality.

Q. On page 27 of your expert report, Exhibit 2, you cited to the 2011 Lipworth study entitled "Cancer mortality among aircraft

manufacturing workers: an extended follow-up"; correct?

A. Correct.

Q. And you stated under the analysis that:

"Employees routinely and intermittently exposed to TCE did not have an excess risk of bladder cancer mortality."

Correct?

A. This study did not show an association between bladder cancer mortality and TCE. Correct.

Q. And on page 28 of your expert report in section B, you cited to the 2003 study by Raaschou-Nielsen entitled "Cancer risk among workers at Danish companies using TCE: a cohort study"; correct?

A. Correct.

Q. On page 28 in your analysis of that study, you indicated:

"Men who were occupationally exposed to TCE did not show an excess bladder cancer incidence."

Correct?

A. Correct.

Q. And on page 29 of your expert report, Exhibit 2, you cited to the 2004 Silver study entitled "Retrospective cohort study of a microelectronics and business machine facility"; correct?

A. Correct.

Q. On page 29 in your analysis of the Silver study, you indicated that:

Investigators found a .04 hazard ratio for TCE exposed workers.

Correct?

A. Correct.

Q. And you would -- you would agree that this study did not show an increased incidence of bladder cancer; correct?

A. Correct.

Q. On page 30 of your expert report, Exhibit 2, you cited to the 2016 Buhagen study entitled "Association Between Kidney Cancer and Occupational Exposure to TCE"; correct?

A. Yes.

Q. And on page 30 of your expert report, Exhibit 2, under your analysis of the

Buhagen study, you stated:

"The author -- the authors provided Standardized Incidence Ratios for cancer overall and for individual cancer sites, including bladder cancer, which showed no excess risk."

Is that correct?

A. That is correct.

Q. In addition, on page 30 of your expert report, Exhibit 2, you cited to the 1994 Greenland study entitled "A case-control study of cancer mortality at a transformer-assembly facility"; correct?

A. Correct.

Q. And on page 30 of your analysis of the Greenland study in Exhibit 2, you stated:

Employees occasionally -- excuse me.

"Employees occupationally exposed to TCE did not have an excess risk of bladder cancer mortality in this study."

Is that correct?

A. Correct.

Q. And on page 30 of your expert report, Exhibit 2, you also cited to the 2013 study authored by Christensen entitled "Risk of

selected cancers due to occupational exposure to chlorinated solvents in a case-control study in Montreal"; correct?

A. Correct.

Q. And on page 30 in your analysis of the Christensen -- Christensen study, you stated:

"Authors found that neither substantial exposure nor any exposure to TCE resulted in an excess risk of cancer when compared to population and cancer controls."

Correct?

A. Correct.

Q. Given the majority of the cases that you've analyzed in your expert report for TCE did not find a positive association, would you agree that that Bradford Hill factor of Specificity has not been met --

A. No.

Q. -- for TCE?

A. Depends on the study in question. A lot of these studies -- I mean, for instance, the one by Christensen, a case-control study had 3,730 cancer cases but only 533 population controls.

A study -- a case-control study you

typically want at least 3 to 1. 3 controls per case, ideally up to 5 to 1. This was completely opposite. So this study really wasn't powered enough to detect an association if an association were to exist.

Further, I would say that, you know, unless there is -- just because a certain study doesn't show an association does not mean that a study that does show positive association is still not valid and supportive of evidence of causal relationship.

Q. If you were to find two studies -- if you were to review two studies that support a positive association between TCE and bladder cancer and two studies that do not show an association between TCE and bladder cancer, would you choose the studies that show a positive association to make your conclusion in this case?

A. Again, it depends on the studies. Depends on the power of the studies. There's specific work examined and how they interpreted their results.

Q. What if they were similar studies of equal merit: Two show a positive association.

Two show no association.

Would you agree that there would not be specificity?

A. Actually, I would -- I mean, a study that shows no association does not -- simply shows no association. It does not show that an association doesn't exist.

Whereas, a study that shows a positive association, especially if it does approach statistical significance, is more supportive of a positive association.

But in a negative study or a study that does not show an association, then that does not necessarily rule out association.

So I would actually, if hypothetically if they were similar, I would gather myself towards the more positive association based on that.

Q. So is it fair to say that if there is no association found in your analysis that that you don't consider those studies when determining the Bradford Hill factor of Specificity?

MR. WALLACE: Objection.

THE WITNESS: Not for

supporting the -- the causal relationship, no, but a positive -- a study that shows a positive association I would consider as supporting the Bradford Hill criteria.

And, again, ultimately you're weighing all the evidence, all the factors of the Bradford Hill criteria in forming the basis of my opinion.

BY MS. KONSTANTOPOULOS:

Q. Moving on to the Bradford Hill factor of Temporality on page 32 of your expert report, Exhibit 2, you simply state in your analysis that:

"In studies finding a statistical" -- I'm sorry.

"In studies finding a significant association between TCE and bladder cancer, all cases were" -- strike that.

You would agree that in your analysis on page 32 of Temporality, you don't specifically cite to any cases there; correct?

A. They're all -- so temporality, that's basically a no-brainer, in my opinion,

within the Bradford Hill. Obviously, if you get the disease before any exposure, it's not going to be related.

All the studies that we consider, regardless of age and the exposure, happened before the outcome. So that is satisfied. I didn't find any studies that were trying to look at exposure after the fact.

So, yeah, that's kind of a no-brainer, in my opinion, that the exposure in all the studies examined theoretically happened before the outcome of bladder cancer.

Q. Would that then be true for basically all of the studies that you reviewed under TCE? Is that -- would that be your analysis --

A. Yeah.

Q. -- regarding temporality?

A. Correct.

Q. So all of the cases that -- so it's your testimony that all of the cases that you reviewed for in your TCE analysis demonstrate temporality?

A. Yes. The exposure occurred before

an outcome.

Q. On page 33 of your expert report, Exhibit 2, you analyzed dose-response; correct?

A. Correct.

Q. And on page 33, you cite to the Hadkhale study; correct?

A. Correct.

Q. Why did you choose this study?

A. (Reviews document.)

Well, it did show a dose-response in that moderate -- people with moderate exposure groups based on their criteria. I don't understand their criteria, but that's what they labeled as moderate.

Had a hazard ratio of 1.07, which was statistically significant, and then the high exposure groups, again based on their cut-off, whatever that means, had a hazard ratio of 1.23, which is, again, statistically significant.

So that did show a dose-response.

Q. How do you reconcile the author's note from the Hadkhale case which indicated the concurrent effects from other solvents could not be discounted? Does that affect dose-response?

A. Anything can affect dose-response, but that specifically? I mean, yeah. I mean, that's a part of the limitation. They could -- if you are looking at -- you're aiming to try to center in on one particular chemical, but one limitation of any occupational exposure is that there could be other exposures as well. That's reality.

Q. Okay. You would agree that in your analysis of TCE studies that there were studies that do not support a dose-response relationship; correct?

A. Correct.

Q. Why did -- how do you justify not including them here in this discussion of dose-response in your Bradford Hill analysis?

A. The way I looked at Bradford Hill is like which, what was supported. If you did not find a dose-response, there obviously is no support for a dose-response based on that study, but it doesn't eliminate the -- that a dose-response may exist.

Again, there were no studies that showed the more TCE you were exposed to, the

better outcomes you had. So -- significant outcomes you had. So that's why I did not include the negative studies.

Q. Okay. One of those negative studies would have been the Sciannameo case that showed non-statistical overall risk of bladder cancer; correct?

A. Correct. That, again, it would depend on the numbers of who -- what the total numbers of subjects were in the highly exposed versus the low exposure group.

Q. And you had the same analysis for biological plausibility, coherence, experimental evidence, and analogy as you did in the PCE Bradford Hill analysis; correct?

A. Correct.

Q. Okay. Now, did you weigh the Bradford Hill considerations relative to each other after you analyzed all these factors?

MR. WALLACE: Objection.

THE WITNESS: One factor versus the other?

BY MS. KONSTANTOPOULOS:

Q. How did you weigh the Bradford Hill

considerations in this for TCE?

A. Again, I used them all in as a totality how much support each one contributed. Obviously, some contributed more support, but ultimately it was all 9 factors that came in forming the basis of my opinion.

Q. All right. I'm going to ask you to refer back to Exhibit 10, which is the IARC 2024 exhibit.

I'm going to point your -- I'm going to direct your attention to page 9 entitled "List of classifications by cancer sites with sufficient or limited evidence in humans, IARC Monograph -- Monographs Volumes 1 through 138a."

A. Correct.

Q. Do you see that page?

Okay. You would agree that TCE is not listed among the "agents with sufficient evidence in humans" for bladder cancer; correct?

A. Correct. It's not listed.

Q. You can also see that TCE is not listed among the "agents with limited evidence in humans" for bladder cancer; correct?

A. Not specifically, but dry cleaning

is.

Q. And when you say "dry cleaning is," you would agree that "dry cleaning (occupational exposures in)" was found to -- was included in the column "agents with limited evidence in humans"; correct?

A. Correct.

Q. It doesn't specifically refer to TCE --

A. Correct.

Q. -- in that description; correct?

A. Correct.

Q. While we're looking at the -- looking at Exhibit 10, looking again on page 9, you would agree that benzene is not listed among the "agents with sufficient evidence in humans" for bladder cancer; correct?

A. Benzene is not. I don't know what benzidine is. I mean, similar word, but I don't know what benzidine is. But I do not see benzene, no.

Q. And you would agree that benzene is not listed among the "agents with limited evidence in humans" for bladder cancer correct?

A. Correct.

Q. Moving on to benzene, on page 33, Exhibit 2 of your expert report, you opine that benzene is a cause of bladder cancer in humans; correct?

A. Correct.

Q. Also on page 33 of Exhibit 2 of your expert report, you note that the IARC 2018 Monographs determined benzene to be carcinogenic to humans; correct?

A. Correct.

Q. Isn't it true that IARC classified benzene as being carcinogenic to humans based on sufficient evidence of an association between benzene exposure and risk of acute myeloid leukemia and myeloma in adults?

A. To my knowledge, that is correct.

Q. The classification of benzene as carcinogenic to humans was not based on a finding of sufficient epidemiological evidence for bladder cancer; correct?

A. It is not by the EP -- not by the EPA, no. Correct.

Q. In your analysis of benzene in your

expert report in section C, Exhibit 2, you go through and cite to a number of studies that evaluate benzene exposure and bladder cancer; correct?

A. Correct.

Q. And under Strength of association for benzene, you cite to four studies that you believe show a significant association between benzene and bladder cancer; is that correct?

A. That is correct.

Q. The first such study was the 2017 Collarile study entitled "Residence in Proximity of a Coal-Oil-Fired Thermal Power Plant and Risk of Lung and Bladder Cancer in Northeastern Italy"; correct?

A. Correct.

Q. Was that a cohort study?

A. Give me one sec here.

(Reviews document.)

Q. To assist you, your analysis is on page 37 --

A. Yeah.

Q. -- of Exhibit 2.

A. It's a -- I mean, it's a

population-based study based on these -- the population living there, this coal field. Yes, it is a population-based cohort.

Q. And the Collarile study evaluated benzene and other chemicals; correct?

A. Correct.

Q. You would agree that there is no increased risk of bladder cancer found for men or women under the age of 75; isn't that correct?

A. Correct.

Q. And the study found inconsistent increases at the highest level exposure by gender and age with no increase for combined ages; correct?

A. Correct.

Q. The authors did not have information regarding cigarette smoking for the study; correct?

A. Correct.

Q. And they could not completely rule it out as a confounder?

A. They couldn't adjust for it.

Q. There was also no information on the daily time participants spent -- spent in each

risk area as a part of this study; correct?

A. Correct.

Q. How does the study show a significant association between benzene and bladder cancer?

A. In -- so you assume that they found that in women 75 years or older the risk of bladder cancer was significantly increased with an incidence rate -- rate ratio of 1.94.

They -- these patients or these subjects were high -- highly exposed to benzene by their criteria, but there could have been misclassification, but if there had been misclassification, that would -- if there had been a misclassification, I would expect it towards the point estimate to come down towards the null.

So you -- so if they got it right or there was minimal misclassification, then it is a significant result.

And if it's with the clinical reality that most bladder cancers occur in an older age group, that you wouldn't expect it in a 50- or 55-year-old person.

Q. And you indicated earlier that age

is one of the risk factors for bladder cancer; correct?

A. Yes, based on diagnosis, but the exposure would likely occur earlier in life.

Q. Another case that you cited to under Strength of association for benzene in your expert report was the 2023 Shala case entitled "Exposure to benzene and other hydrocarbons and risk of bladder cancer among male offshore petroleum workers"; correct?

A. Correct.

Q. And this was a cohort study of, obviously, only male offshoremen; correct?

A. Correct.

Q. And authors used job exposure metrics to attempt to quantify exposure to benzene; is that right?

A. Correct.

Q. And the authors noted that the lack of information on work history during that follow-up could have led to exposure misclassification or distortion of potential exposure-response associations; correct?

A. Correct.

Q. How are petroleum workers in Norway similar to those at Camp Lejeune?

MR. WALLACE: Objection.

THE WITNESS: From my reading, the breakdown of fuel tanks and things like that could have led to some of the water contamination at Camp Lejeune.

The petroleum obviously was a surrogate -- petroleum workers cohort was a surrogate to look at benzene exposure. So that's why they used that.

So whether or not benzene is in petroleum versus contaminated water, it's still benzene.

So that that would be the similarity, in my opinion.

BY MS. KONSTANTOPOULOS:

Q. And you don't have an opinion in your expert report on how the water at Camp Lejeune was contaminated; correct?

A. No, that's not my expertise.

Q. Okay. You also cited in your expert report under Strength of association, Exhibit 2,

the 2017 Hadkhale case that we have also discussed earlier; is that correct?

A. Correct.

Q. And you indicated that there was an increased risk of bladder cancer -- or excuse me.

You indicated that there was an increased risk of -- you indicated that the increased risk of bladder cancer was found with high exposure to benzene versus no exposure; is that correct?

A. Correct.

Q. The hazard ratio that you're referencing is 1.16; correct?

A. Correct.

Q. You would agree that benzene wasn't the only solvent in this study, as previously discussed?

A. Correct.

Q. And smoking was not used as a confounding factor in this study; correct?

A. It was not adjusted for. Correct.

Q. Okay. And the last study that you cite under Strength of association for benzene is the 2024 Xie study, which is entitled Occupational

exposure to organic solvents and risk of bladder cancer"; correct?

A. Correct.

Q. You indicated that this case "showed a statistically increased risk of bladder cancer in those 'ever' exposed to benzene"; is that right?

A. Correct.

Q. And this is a population-based study; correct?

A. Population-based case-control study, correct.

Q. You agree that the Xie study had positive results but lacked internal consistency and lacked dose-response relationships; correct?

MR. WALLACE: Objection.

THE WITNESS:

(Reviews document.)

Correct on the lack -- did not show a dose-response.

And what was the first one?

BY MS. KONSTANTOPOULOS:

Q. You would agree that the Xie study had positive results but lacked internal

consistency?
A. I don't know what that means.
Q. All right.
A. "Internal consistency."
Q. But you agree that the Xie study lacked a dose-response relationship; correct?
A. Correct. The dose-response was not seen.
Q. Okay. And in addition to benzene, there were other chemicals found in the study; correct?
A. Correct.
Q. I believe those included toluene and xylene; is that correct?
A. To my knowledge, yes.
MS. KONSTANTOPOULOS: If I said those correctly.
I'm going to mark as Exhibit 14 the 2024 Xie study entitled "Occupational exposure to organic solvents and risk of bladder cancer" that we are currently discussing.
(Document marked for identification as Culp Exhibit 14.)

BY MS. KONSTANTOPOULOS:

Q. I'm going to point your attention to the first page under IMPACT in the gray box.

A. Uh-huh.

Q. You would agree that it states -- the authors of Xie state:

"There is limited evidence about the role of exposure to specific organic solvents, alone or in combination on the risk of developing bladder cancer. In this study, workers with increasing exposure to benzene, toluene, and xylene as a group (BTX) had a statistically significant exposure-response relationship with bladder cancer. Future evaluation of the carcinogenicity of BTX and other organic solvents, particularly concurrent response -- concurrent exposure, on bladder cancer development is needed."

You would agree that this study found that there was limited evidence based on the authors of this study on the role of exposure of these chemicals together; correct?

MR. WALLACE: Objection.

THE WITNESS: Limited

evidence means that -- the way they're using it here means there's not -- the evidence in the literature is limited. I don't think it relates to their study or their findings.

BY MS. KONSTANTOPOULOS:

Q. But you would agree that the authors even indicate that additional studies are needed; correct?

A. Yeah, and, in fact, the Yu et al. study that I mentioned earlier that I added after the fact.

Do we have a copy of that?

MR. WALLACE: I don't.

THE WITNESS: Actually used a population-based, the UK database, and they had hundreds of thousands of people. And they actually looked at the same chemicals and they found that, you know, a reliable replication of these results but better.

So, I mean, yes, further studies have been done, and they show a positive association.

BY MS. KONSTANTOPOULOS:

Q. The Yu study that you're talking about, that was a preprint study; correct?

So it's final yet; is that fair to say?

A. It was published in March of 2025. So it is in the literature. It was not in my report because it wasn't published yet, but it is currently published as of March 2025.

Q. And that study similarly indicated that additional studies were needed; is that right?

A. Not really. I mean, that was -- that was a very strong population-based study looking at ben -- these chemicals. It did not look at PCE or TCE. It looked benzene and these other chemicals BTEX, B-T-E-X. So.

Q. It looked at the combination of chemicals that BTEX stands for; correct? This is the Yu study?

A. Yes.

Q. Okay. For the Consistency factor under your evaluation of benzene in your expert report, Exhibit 2, you state that:

"Studies finding significant associations between exposure to benzene and risk of bladder cancer were based on separate and unique cohorts. This was also true of studies that found an increased point estimate in risk but was otherwise not significant."

Is that correct?

A. Correct.

Q. You would agree that there were other cases, though, that found no association between benzene and bladder cancer; correct?

A. Correct.

Q. One of those cases was the 1986 study by Bond that you cited on page 34 of your expert report, Exhibit 2; is that correct?

A. Correct.

Q. And you indicated "for the total cohort" -- under your analysis of the Bond 1986 study -- "bladder cancer mortality was not elevated"; correct?

A. (Reviews document.)

Correct.

Q. And on page 35, Exhibit 2 of your expert report, you cited to the 2004 Bloemen

study, which you stated:

"Mortality from bladder cancer was not elevated."

Correct?

A. That was not found in this study. Correct. Based on three deaths, only three deaths.

Q. You also cited on page 35 of your expert report, Exhibit 2, to the 2015 Collins study; correct?

A. Correct.

Q. And you indicated that over 30 years of latency, bladder cancer mortality was only at 1.04, which does not show a significant positive association; correct?

A. Correct, based on this study's results.

Q. Okay. On page 35, you also cited in your expert report, Exhibit 2, to the 1987 Wong study; correct?

A. Correct.

Q. And you indicated that the standard -- standardized mortality ratio for bladder cancer mortality for all cohort members

was .816; is that correct?
A. Correct.
Q. And that does not show a positive association between benzene and bladder cancer; correct?
A. Does not show a significant association. Correct.
Q. Well, it doesn't show any association under a figure under 1.
Doesn't it show an inverse relationship?
A. No, it doesn't show a positive relationship. I mean, it doesn't show a positive association. Correct.
Q. Okay. On page 36 of your expert report, Exhibit 2, you cite to the 1997 Lynge study; correct?
A. Correct.
Q. And in that study, you indicated that the standardized incidence ratio for bladder cancer for men in the total cohort was 1.1 and for women it was .5; correct?
A. Correct.
Q. And that doesn't show a positive

association either; correct?
A. Not -- no, it does not.
Q. On page 36 of your expert report, Exhibit 2, you cite to the 2005 Sorahan study; correct?
A. Correct.
Q. And this is a cohort study that did not find an increased risk of bladder cancer deaths; is that right?
A. Correct.
Q. On page 36 of your report, Exhibit 2, you also cite to the 2015 Linet study; correct?
A. Correct.
Q. And here on page 36, you stated that the relative risk of bladder cancer mortality was only .9; correct?
A. It was 0.9, correct.
Q. 0.9.
On page 38 of your expert report, you also cite to the 1994 Greenland study; correct?
A. Correct.
Q. And you indicated that "As it

relates to association between benzene exposure and bladder cancer mortality, the odds ratio was 1.02"; correct?

A. Correct.

Q. And that also does not show a positive association between benzene and bladder cancer; correct?

A. Not a significant positive association, correct.

Q. Now, going -- moving on to dose-response.

On page 40 of your expert report, Exhibit 2, you cite to the Hadkhale study and the Collarile study that we discussed earlier.

Why did you choose these two studies to support dose-response?

A. The -- well, as discussed, the Hadkhale study had a dose-response of a medium exposure of 1.05, which was statistically significant, and 1.16 of the high exposure rate, which was also significant -- statistically significant, and that does show a dose-response.

In terms of the -- go back to the old fire pit thing.

(Reviews document.)
Page -- oh, yes. Okay.
(Reviews document.)
So the -- this study did not find the higher -- high exposure to benzene showed the significant increase and risk in women 75 or older as opposed to lower exposure, which did not show any positive association.

Q. You would agree that you cited to multiple studies in your overall analysis that do not support a dose-response relationship; isn't that true?

A. Correct.

Q. But you did not mention them in your analysis of dose-response for benzene here; correct?

A. Correct.

Q. Which Bradford Hill factors did you give the most weight to when analyzing benzene?

A. I, again, used all the factors together in my -- forming my final opinion and not one specifically.

Q. Were there any that received less weight?

A. I mean, as you could see, I mean, there some have more support than others, but ultimately it's the culmination of all 9 factors for me.

Q. You agree that you don't have an analysis here that specifically describes how you weighed consideration -- these considerations in your expert report for benzene; correct?

A. Correct. I weighed them all together as one. Some were more supportive, but those that lacked as much support did not necessarily negate an association.

Q. Earlier you stated that you used the 2017 ATR that's in evidence to help form your opinion; correct?

A. It was one of the -- yes.

Q. And specifically on -- and specifically you stated on page 5 Exhibit 2 of your expert report:

"In its 2017 assessment of the Camp Lejeune water contamination, ATSDR applied the 'at least as likely as not' standard."

Correct?

A. Correct.

Q. And on page 6 of your expert report, Exhibit 2, you stated:

"Given that the same standard governs my analysis here, in addition to other considerations regarding the relevant literature, I agree with ATSDR's approach and employ the same in my review."

Correct?

A. It's on page what number?

Q. Page 6 of your expert report, Exhibit 2.

A. I have page -- it's on page 5.

"Given that the same standard governs my analysis here, in addition to other considerations regarding the relevant literature, I agree with ATSDR's approach and employ the same in my review." Correct.

Q. Thank you. Page 5. I appreciate it.

I'm going to direct your attention back to Exhibit 5 the ATSDR 2017 Assessment of the Evidence.

I am going to point your attention to page 95 of Exhibit 5.

Do you see the section entitled "TCE"?

A. Yes.

Q. You would agree that ATSDR in its 2017 Assessment of the Evidence concluded, and I quote:

"ATSDR concludes that there is below equipoise evidence for causation for TCE and bladder cancer."

Correct?

A. As stated in the 2017 publication, correct.

Q. And you would agree that for -- that the last sentence under the section for vinyl chloride and benzene, it states:

"Therefore ATSDR concludes that for vinyl chlorine chloride and benzene there is below equipoise evidence for causation for bladder cancer."

Correct?

A. In the 2017 ATSDR report, correct.

Q. I should have asked this earlier, but have you or anyone in your family been in the military?

A. No. I mean, nobody in my immediate family.

Q. Okay.

A. I mean, back in World War II type of thing, but they're all dead and stuff. (Laugh).

Q. So.

A. My great uncles and stuff.

Q. Okay. So neither you nor any member of your family was ever stationed at Camp Lejeune?

A. No.

MS. KONSTANTOPOULOS: Okay. I'm going to move on to a discussion of the invoices that you recently provided.

We're marking your invoices as Exhibit 14 -- 15. We are marking your invoices as Exhibit 15.

(Document marked for identification as Culp Exhibit 15.)

BY MS. KONSTANTOPOULOS:

Q. And please note that we have put them in chronological order based on invoice date.

MR. WALLACE: Is there?

Thank you.

BY MS. KONSTANTOPOULOS:

Q. It's my understanding that your baseline billable rate is $600 per hour; correct?
A. Correct.
Q. And your travel time is also $600 an hour?
A. Correct.
Q. And you have support staff that assist you; is that correct?
A. Yes.
Q. And what relationship do they have to you?
A. They -- as mentioned earlier, they provide the logistics of scheduling meetings, admin support, pulling documents, pulling papers that I direct them to. If I have direct access to a paper, I pull it myself, but I don't want to bill $600 to go search for it in the library when they could do it at a much more cost-effective rate.
Q. Do the -- does your admin support staff review medical bills or drafts of expert reports as a part of their role?
A. Not to my knowledge.
Q. And on -- in Exhibit 2, Exhibit B,

which is your fee schedule, you list Physician's Support Staff; correct?

A. Correct.

Q. And under Physician's Support Staff, you include an associate scientist, staff MD/PhD epidemiologist, and nurse practitioner (advance practice); correct?

A. Which I have never used. (Laugh).

Q. Okay. So these individuals or the physician's support staff did not assist you in your work on this case?

A. No. No.

Q. Okay.

A. I should take that out. When I did this initially, I just did a standard, but I never actually used them. So, or anybody like that.

Q. Okay. I believe earlier you indicated that you were first retained approximately sometime around June of 2023; is that correct?

A. To the best of my knowledge.

Q. And you would agree that in the first invoice the first time that you billed in this case was actually June 12th of 2023; is that

correct?

A. (Reviews document.)

Correct.

Q. Okay. And you billed for something called "Review Medical, Scientific, or Regulatory Literature"; correct?

A. Correct.

Q. What does that mean?

A. In this instance, it's likely the ATS -- ATSDR documentation, the initial scientific articles, things like that.

I have not reviewed anything medical. I think that's a catchall phrase that they put in there. When I submit, I usually just say review of literature, review of regulatory documents.

Q. Okay. And then there are a number of additional entries underneath your billed items, correct, on the first page of Exhibit 15? Where the rate is $215 an hour?

A. (Reviews document.)

Correct.

Q. And that is not work that you performed; correct? Because that's at a much

lower rate.
A. To my knowledge, that is correct.
Q. Who performed that work?
A. I would anticipate it's possibly my admin staff.
Q. Did your admin staff travel with you for conferences or meetings?
A. No.
Q. Do you know why they would bill for "Client Project Conference or Meeting"?
A. They're routinely present at meetings in case we need them to do something or to facilitate future scheduling and future whatever is needed admin-wise.
Q. And the admins that you're referencing that are charging $215 an hour, are they employed by Medical Science Affiliates, LLC?
A. They are.
Q. And I think you might have been referring to Medical Science Associates probably?
A. That's my bad.
Q. It's okay. I assume you mean --
A. Yeah, yeah.
Q. -- Medical Science Affiliates, LLC;

correct?

A. There's only one. Yes.

Q. Okay. And the bottom left-hand part of the invoice on this first page of Exhibit 15, you would agree that there is a letter, a number "M223024 - Camp Lejeune Consulting (Dr. Stephen Culp)"; correct?

A. Correct.

Q. Was the mandate articulated in Exhibit 2 of your expert report the same mandate that you were given when you were first retained in this case?

A. Yes.

Q. Were there any other mandates that you were given as a part of your expert work in this case?

A. No.

Q. And move on to the next, second page of Exhibit 2 -- I mean, Exhibit 15. Sorry.

Do you know what this "Project Communication/Coordination" bill of $225 is related to?

A. No, not specifically.

Q. Do you approve the admin -- the

admin billing?

A. No.

Q. Okay. Did this -- do these invoices come from you specifically or from Medical Science Affiliates, LLC?

A. I submit my invoice to Medical Science Affiliates, who then submit it to the legal team, and they pay it off and then I get paid from Medical Science Affiliates --

Q. Do you --

A. -- for my hours.

Q. Do you see what the admins are billing before you submit your time?

A. Not specifically.

Q. Okay. Were you ever asked to perform any consulting work on an individual by the name of Stephen Dunning in relation to this case?

A. Not to my knowledge.

Q. Are you aware that Stephen Dunning is a plaintiff --

A. Not to my knowledge.

Q. -- in this case?

A. I have not reviewed any -- any

plaintiff files or medical records.

Q. On -- if you look at the bottom right of your exhibit, there should be a 00016 number on an invoice dated May 17th. It would be the -- the 8th page of your -- of Exhibit 15.

A. Okay.

Q. The fourth item down includes "Creating Report Template Per Expert's Direction" May 1 to May 2.

Did I read that correctly?

A. Correct.

Q. Is that a report template for the expert report that you are testifying about here today?

A. The best of my knowledge, that's probably -- I remember having meetings where we were trying to come up with a system by which, if we are approaching that point in time where I am reviewing medical records -- I don't know if you've seen medical records. It's like a whole bunch of stuff. Again, from a cost-effectiveness, I don't want to, like, drudge through to find such and such and spend an hour doing so.

So what I did was, working with the

admin staff is, say, okay, this is -- when I review a case, this is what I want to see. This is what I, you know, what are the medical problems, what are their social history, medications, things like that not only. And then, obviously, smoking status and things, if that's included in their medical record, and kind of flesh out what the pertinent positives are and the pertinent negatives rather than just deliver into my e-mail box a 900-page file of medical records.

So I know -- I know I did discuss that with the admin team, and we worked on that to figure out if, when it happens -- I'm assuming it's going to happen maybe -- that that's the kind of a route we would take.

Q. And you -- part of what you just talked about was your assessment of differential diagnosis; is that right?

A. Correct.

Especially the VA. Oh. Those medical records are the worst. (Laugh).

Q. Fair.

A. Don't quote me on that. (Laugh).

Q. Unfortunately, I think you're

quoted.

A. (Laugh).

Q. And it looks like there was -- unfortunately, I don't know the exact page number, but the invoice is dated October 11, 2024. It is the 14th page of Exhibit 15.

I'm looking at the bottom left-hand corner of that invoice and there is a number with a letter, which is M224168- and then it states "Edward Raymond/United States of America (Camp Lejeune) (Dr. Stephen Culp)."

You're aware that Edward Raymond is a plaintiff in this matter; correct?

A. I -- I assume that. Yes, we had discussed reviewing his records, but then immediately was asked not to review, which I did not.

Q. Looks like the first item on this invoice is 1.25 hours "Review Case File" October 2nd and October 9th; correct?

A. Correct.

Q. Did you review his file for approximately 1.25 hours before you stopped reviewing it?

A. I mean, I don't -- I never reviewed it. I never downloaded it.

Q. What is this 1.25 hours then in the first item relating to Edward Raymond that states "Review Case File"?

A. I'm not sure, to my knowledge, what -- what that is.

Q. Okay. Were you asked to consult on the review of any other medical records of plaintiffs, other than the brief time where you were asked to consult on Edward Raymond?

MR. WALLACE: Objection.

THE WITNESS: Not to my knowledge.

BY MS. KONSTANTOPOULOS:

Q. Were you asked to consult on anything other than the mandate that you testified to in your expert report on Exhibit 2 in this case?

MR. WALLACE: Objection.

THE WITNESS: No, not to my knowledge.

BY MS. KONSTANTOPOULOS:

Q. How much time did you spend

preparing your expert report, Exhibit 2?

A. I felt like an eternity. (Laugh).

I mean, whatever I put down is the time I spent. I don't know where that is. It's late last year when...

Q. Well, was it in the invoice dated December 13, 2024 where you billed 15 hours for something called "Review Case File" and you listed November 23rd, November 30th?

A. Yeah, that would have been it.

Q. Okay. Is that -- are those all?

A. I was prepare -- I was preparing my personal -- my expert opinion report. So.

Q. Okay. And that's the total amount of time you spent preparing your report; is that correct?

MR. WALLACE: Objection.

THE WITNESS: Not the total. I know, I mean, my preparation, obviously, for the expert -- my expert opinion was done over many months.

The final report, though, was concentrated over about a month, and that was close to the date where it was

written up in final form and signed off on.

BY MS. KONSTANTOPOULOS:

Q. So I apologize.

When did you start working on the expert report? Approximately what month? What year?

A. I'd say bits and pieces started at about a year before it was finalized, just gathering information on paper.

Q. There is an item in that same invoice we were discussing, the invoice dated December 13, 2024. It's the third line item down.

It states ".75 Research/Receive -- Retrieved Medical, Scientific, or Regulatory Literature." And there's a $295 charge or rate next to that. I'm sorry. The rate.

A. Yes.

Q. Who -- who did that?

A. I'm -- I'm not sure. I don't know. It's not me. It wasn't me. Anything with 600 is me. Otherwise I don't know exactly the individual who billed for the other stuff.

Q. Did someone assist you in

researching for your expert report?

A. Not for researching. For at my direction, they would pull articles, pull manuscripts, pull papers, things like that.

Q. Did any of these admin -- admin who billed in your invoices, did any of them draft any portion of your report?

A. No, not -- they did not draft any portion of the report. No, it was all done by me.

Q. You would agree that they would -- they edited your final report, though; correct?

MR. WALLACE: Objection.

THE WITNESS: To the degree of kind of putting it together, formatting issues, things like that, yes, but not the substance.

BY MS. KONSTANTOPOULOS:

Q. Okay. And I ask because the second to last entry in that invoice dated December 13, 2024 states "Editing and Finalizing Report" December 2nd, December 5th, December 12th with a rate of $225.

A. Yeah. Assistance of me finalizing the report and getting it to counsel.

Q. What is the entry "Client Project Conference or Meeting" mean? I'm looking at the last page of Exhibit 15. It's the invoice dated 3/14/2025.

A. The "Client Project Conference Or Meeting"? That, that one?

Q. Correct.

A. I am assuming it is a meeting between me and counsel.

Q. And you have additional invoices since this last invoice date of February 27th of 2025; correct?

A. I have submitted one since May. So I submitted -- I submitted an invoice mid-April for one hour of time for a client meeting with counsel. And since mid-April till today, I'm going to have the invoice for all the work I've done this past month. Correct.

Q. Okay.

A. I have not submitted an invoice, but it will.

MS. KONSTANTOPOULOS: Okay. Counsel I would just ask that you provide that to us when you have it, along with

the updated CV that Dr. Culp referenced.

MR. WALLACE: All right. Yeah. We can address that.

MS. KONSTANTOPOULOS: Thank you. I appreciate it.

MR. WALLACE: Thank you.

MS. KONSTANTOPOULOS: Can we take a quick 10-minute break?

THE WITNESS: Yeah.

MR. WALLACE: Yes.

THE WITNESS: I was hoping you would say that. Coffee.

THE VIDEOGRAPHER: The time is 2:52 PM. We are going off the record.

(A recess was taken.)

THE VIDEOGRAPHER: The time is 3:18 PM. We're going back on the record. Please proceed, counsel.

MS. KONSTANTOPOULOS: Thank you.

BY MS. KONSTANTOPOULOS:

Q. Earlier I might have referred to the ATSDR Assessment of Evidence as the ATDR Assessment of Evidence.

You understood that I was referring to the ATSDR Assessment of Evidence; correct?

A. Correct.

Q. Okay. Going back to Exhibit 15, which are your invoices.

A. Okay.

Q. Looking again at the invoice dated December 13th of 2024.

You stated earlier that there was a charge by an administrative individual for "Editing and Finalizing Report" of 6.5 hours; correct?

A. Correct.

Q. Do you know the name of the individual that finalized or edited your report?

A. No, not specific.

Q. Have you ever met that individual?

A. Probably. I know individuals who I work with. There's about three or four individuals that worked, but I don't know specifically who that refers to or could it be a number of individuals. I don't know.

Q. Do you know what their credentials are?

A. Not offhand, no.
Q. And how did they return their edits to you? Was it in redline or in some other form?
A. (Pause). Most of my edits -- any edits that I would have done and passed on would have been through highlighting or comment.
Q. So I'm referring specifically to the work the admins performed on editing and finalizing your report.
How did they provide those edits or finalizations to you?
A. It was back and forth. I mean, making sure everything was as crisp as could be and read well -- read well with least grammatical errors. I don't know the specifics of that specific, the 6 and a half hours.
Q. Were you able to track the changes that they made?
A. Any changes that were made were sometimes tracked, not always, but most -- most all changes were made by me.
Q. Were the changes that they made -- strike that.
Were the changes that were made

clear to you when you would receive an edited version?

A. Yes. Like where specific how the breakdown of the report would be, where you --

MR. WALLACE: I'm going to step in right here, and to the extent that counsel for the DOJ is asking about the content of any communications or documents that Dr. Culp shared with anybody that is employed by him or associated with him, such information is not discoverable.

And I advise you not to answer any questions about the content of those documents or communications.

THE WITNESS: I will refrain from answering.

BY MS. KONSTANTOPOULOS:

Q. I'm not asking about the content. I'm asking about how you were able to track any changes.

MR. WALLACE: And my -- and my -- I still object on the basis of such information not being discoverable under

CMO 17. It -- yeah, my objection still stands.

MS. KONSTANTOPOULOS: Fair, and you're still instructing your -- Dr. Culp not to answer at all?

MR. WALLACE: To the extent that he can answer your question without getting into the content of information or documents or communications that he shared with people he works with.

THE WITNESS: Suffice it to say, everything in this document was written by me, approved by me, and signed off by me.

BY MS. KONSTANTOPOULOS:

Q. Okay. And, again, to be clear, the admins that you've been referring to do not work for you. They work for Medical Science Affiliates, LLC; correct?

A. Correct.

Q. Okay.

A. I do not pay them.

Q. And they are paid by Medical Science Affiliates, LLC, to your knowledge?

A. I -- to my knowledge, yes.
Q. And according to these invoices, they're paid -- these invoices are paid by the Bell Legal Group; is that correct?
A. To my knowledge, yes.
Q. Okay. Moving on to -- moving back to the Yu article that you discussed, the new article that you were talking about.
A. Uh-huh.
Q. Earlier I indicated -- I asked you if this was a preprint version of the study.
It wasn't a preprint version, but it is a preproof publication; correct?
A. Are you referring to EPUB? ePublished? It's a manuscript you can download from the journal on the web, correct. I don't know if it's physically in a book or a manuscript journal.
Q. What I mean by preproof is that it hasn't been officially finalized yet; correct?
A. If it's accepted for publication and published in a PDF, then it has been reviewed -- peer reviewed and published, yes. It has been approved by definition.

Q. So if I were to tell you that the cover page states that it will undergo additional review before it is published in its final form, that would be incorrect?

A. I personally downloaded the paper from the journal. So I would assume that it is published and approved.

There might be a preprint out there, I guess.

Q. And you would agree that it was counsel that provided you with a copy of the study; correct?

A. Correct.

Q. You would agree that there was no individual exposure data in this report; correct?

MR. WALLACE: Objection. Objection.

THE WITNESS: I'd want to see the article before answering that question.

BY MS. KONSTANTOPOULOS:

Q. Well, you would agree that exposure was estimated using a computer model; isn't that correct?

A. Again, I would want to see the manuscript before I answer that question. Because I know there's exposure -- low level exposure that they evaluated, but I would want to refresh my memory on exactly what they looked at.

Q. And you would agree that the study does not focus on the effects of bladder cancer in BTEX -- BTEX and bladder cancer but, rather, on other diseases; correct?

A. I really wish we had a print of that. (Laugh).

I cannot answer that without looking at the study.

MS. KONSTANTOPOULOS: Counsel wants to print a few copies, I would be amenable to that.

MR. WALLACE: This is your deposition.

BY MS. KONSTANTOPOULOS:

Q. Is it your testimony here today that the Yu March 2025 study has undergone peer review?

A. To my knowledge, yes, based on its publication in a peer-reviewed journal.

Q. What journal was it published in?

A. I don't know -- remember the specific name. That is -- it is accessible to maybe look it up.

Q. You would agree that there is some information missing from this study, for example, tables are still missing and need to be added, correct, before it can be finalized?

MR. WALLACE: Objection.

THE WITNESS: Not to my knowledge.

Again, the study I downloaded myself seemed to be complete in published format.

MS. KONSTANTOPOULOS: All right. Thank you for answering all my questions.

I now pass the witness.

MR. WALLACE: All right. Thank you.

EXAMINATION

BY MR. WALLACE:

Q. Dr. Culp, I have a few questions for you.

During your deposition, counsel for

DOJ asked you questions concerning smoking as a potential confounder for bladder cancer.

You recall that?

A. Yes.

Q. Okay. What role does smoking have in an epidemiological study involving bladder cancer?

A. So we know that smoking, based on multiple studies, has a risk factor for bladder cancer. Obviously, there are people who don't smoke who get bladder cancer. There are people who smoke that don't get bladder cancer. But we know based on the available data, that smoking is an established risk factor.

Now, in looking at smoking in other studies looking at bladder cancer, by definition, a confounding variable has to be associated with both the exposure and also the outcome.

We know, based our evidence already obtained, that smoking is -- is associated with the outcome of developing bladder cancer. However, there is no reason to assume that smoking is associated with the exposure to PCE, TCE, or benzene.

Those who are exposed to PCE, there's no reason, in my mind, to say that somehow those that were exposed to these chemicals were somehow different in their smoking habits versus those that were not exposed.

Therefore, in that -- in that context, it would lead to, if anything, misclassification, nondifferential misclassification bias, which would ultimately lead the point estimate towards the null.

Q. Okay. All right. You mentioned misclassification bias.

Can you describe what that means?

MS. KONSTANTOPOULOS:

Objection to form.

THE WITNESS:

Misclassification bias. So when you go back and you look at exposure, first, again, you got exposure. You got outcome.

Outcome you want to make sure that if you're looking at an incidence, you want to make sure the patient was diagnosed with urothelial bladder cancer,

not some other type of bladder cancer. If they died of bladder cancer, ideally you would want that, to know that.

Unfortunately, death certificates are not perfect, and they don't always list what they died of. Or the patient may have had bladder cancer, but died of a heart attack. Therefore, they didn't necessarily didn't have bladder cancer, but that was not what was used in the outcome as the event.

Likewise an exposure, you would want to, you know, was the patient exposed? Was the patient not exposed? And invariably and unfortunately -- and this is reality -- when you do retrospective studies, it's sometimes difficult to remember the levels of (A) if you were exposed or not and (B) how much were you exposed.

So all of that is, you know, it's inherent in any retrospective study. Again, that's why, prospective cohort, randomized control studies are the best

studies. Because when you follow patients in time, you know exactly what's going on. It's very -- I mean, this is obviously the most expensive studies, but you eliminate or try to minimize any sort of misclassification, which can ultimately affect your study results.

BY MR. WALLACE:

Q. You mentioned just now prospective randomized control studies as studies that could help eliminate misclassification bias.

Are you aware of any prospective randomized control studies involving any of the chemicals that individuals were exposed to at Camp Lejeune?

A. No.

MS. KONSTANTOPOULOS: Objection to form and foundation.

THE WITNESS: It -- it would be unethical to expose any person or group of people to a potential carcinogen.

BY MR. WALLACE:

Q. Okay. One of the Bradford Hill

viewpoints that you discussed in questioning by counsel for DOJ was the viewpoint of consistency.

Do you recall that --

A. Yes.

Q. -- testimony?

MS. KONSTANTOPOULOS: Objection to form.

BY MR. WALLACE:

Q. All right. Can you explain what consistency means in the context of the Bradford Hill viewpoints?

A. So consistency from my use of it in the Bradford Hill is using unique and multiple cohorts to examine (A) the question at hand. So a number of these studies were follow-ups. You know, we looked at 10-year, you know. There's one study had three or four follow-ups.

Yes, that might be a valid study, but that doesn't add to the consistency of satisfying that criteria for the Bradford Hill.

What satisfies is, you know, we're looking at this cohort in Norway. We're looking at this cohort in Illinois. We're looking at exposure in different elements and different

cohorts and finding similar results.

That's where consistency lies in the Bradford Hill analysis.

Q. And if you see elevated associations in two different populations, does that support consistency, in your opinion?

MS. KONSTANTOPOULOS: Objection to form.

THE WITNESS: It supports positive association, yes.

BY MR. WALLACE:

Q. Okay. We also talked about -- excuse me.

In questioning from counsel for the DOJ, you discussed the Bradford Hill viewpoint of biological plausibility.

Do you recall that?

A. Yes.

MS. KONSTANTOPOULOS: Objection. Form.

BY MR. WALLACE:

Q. Can you explain what biological plausibility means within the Bradford Hill viewpoint --

MS. KONSTANTOPOULOS:

Objection to form.

BY MR. WALLACE:

Q. -- analysis?

A. Is it -- well, the plausibility. Is this something that is reasonably inferred that can cause a bad outcome? So if you have a chemical, you have an outcome.

Is there -- is it biologically possible that relying, again, on the toxicology experts and their analysis, that if a chemical is beyond what would be considered safe, is it biologically possible that it could cause a cancer, namely, bladder cancer, and my answer is yes.

Q. Okay. So you said you -- let me ask.

Did you review -- I'm sorry. Let me take a step back.

In the plaintiffs' -- other plaintiff experts there, the toxicologists, did you -- were their reports consistent with your understanding of how chemical exposures can cause bladder cancer?

MS. KONSTANTOPOULOS:
Objection to form.
THE WITNESS: Yeah. I mean, I did -- I didn't do my own independent toxicology review, but I did an independent review of their review and found that their support of biologic plausibility was met.

BY MR. WALLACE:

Q. Okay. What is your understanding of the plausible mechanism behind why TCE, PCE, or benzene can cause bladder cancer?

MS. KONSTANTOPOULOS:
Objection to form.
THE WITNESS: As mentioned, with each of the chemicals in the -- my report in the analogy section, I think smoking is a great analogy.

Cigarette smoke is not just one chemical. It's a variety of chemicals that's metabolized by the lung, filtered down into the kidney, and ultimately stored in the bladder until it's eliminated from the body. That's

why I think of bladder as an exposure-related disease.

When chemicals get broken down in whatever form that might be and get filtered through the kidney, they sit in the bladder for, you know, hours. When we look at bladder cancer, it is a field effect disease.

So when you have diagnose with bladder cancer and I go in and I remove a bladder tumor, if I don't scope that patient three months later, I have committed medical malpractice. Simply because whatever caused that tumor in the first place, every cell in the bladder has been exposed to, and that's why I said 50 percent will go on to have a new tumor. And I'd say 90, 95 percent of the time that new tumor is a separate area than the original tumor.

A lot of people ask: Why don't you just take out that part of the bladder and surgically remove it? Again, that would be medical malpractice because

it's a field effect disease. Every cell -- and I've done three patients in my lifetime, my career, and each one of those patients recurred and ended up having to have their whole bladder removed.

So it is well-accepted in the urologic -- urologic oncology community that bladder cancer is a field effect disease based on exposure to a carcinogen via it from cigarette smoke or be it from other chemicals and, in my opinion, TCE, PCE, and benzene are all candidates for that.

BY MR. WALLACE:

Q. I want to shift gears and talk about limitations on studies. Throughout your deposition, counsel for DOJ asked you about various limitations on studies.

Do you recall that testimony?

A. Yes.

Q. All right. Are you aware of any studies looking at TCE, PCE, or benzene exposure that do not have limitations?

A. No.

Q. Okay. Does the mere presence of limitations in a given study give you reason to disregard that study?

A. No. In fact, if a limit -- if the discussion in a paper or manuscript I was reviewing did not list its limitations, I would not put that forward, that paper, for acceptance in a journal because the authors do not recognize their limitations on what they were looking at.

Q. All right. So is --

A. Or how they analyzed it.

Q. Is it your testimony that it's actually a strength of a paper if it lists its limitations?

MS. KONSTANTOPOULOS: Objection to form. Foundation.

THE WITNESS: Yes. I mean, if -- anybody can list a limitation, but if it makes sense that these are limitations and that they could affect the results, then, yes, it strengthens the conclusion or the inference of the author in their assessment of what the results were.

BY MR. WALLACE:

Q. Now, earlier you were talking about misclassification bias as one such limitation; is that correct?

A. Correct.

Q. Now, you also said another phrase that I'd like to ask you about. You said bias towards the null.

What does "bias towards the null" mean?

MS. KONSTANTOPOULOS: Objection to form.

THE WITNESS: So the null is basically 1.0. That is assuming -- you're assuming that there's no association -- your a priori assumption is that there is no association between chemical exposure and bladder cancer.

When you have a significant -- statistically significant result of positive association, then you reject the null -- reject the null hypothesis that there's no association. That's why it's called the null.

So the null is 1.0. So when you have nondifferential misclassification, that means that either there's no reason -- again with cigarette smoking, there's no reason to think that somebody exposed and not exposed would be more or less likely to smoke.

When you misclassify, it actually brings the true estimate down towards the null, and it can actually alter. You might have a positive association, but in the end you don't see it because of that nondifferential misclassification.

BY MR. WALLACE:

Q. Did you see evidence of nondifferential misclassification bias in the studies that you reviewed for this case?

A. Yeah. I mean, there's plenty of -- there's plenty -- plenty of the studies that you can have nondifferential misclassification bias.

Q. Okay. And those instances of nondifferential misclassification bias are listed

in your report?

MS. KONSTANTOPOULOS:

Objection to form.

THE WITNESS: I believe, yes.

BY MR. WALLACE:

Q. Okay. And to the extent that they're not listed in your report, one could go back and look at the studies themselves and see if the authors of the studies had identified misclassification as a potential limitation?

MS. KONSTANTOPOULOS:

Objection to form.

THE WITNESS: Correct.

BY MR. WALLACE:

Q. Okay. You were also asked some questions about two review agencies: EPA's 2020 Risk Assessment for PCE and IARC's evaluation -- 2014 evaluation of PCE, TCE, and other chlorinated solvents.

Do you recall that testimony?

A. Yes.

Q. Okay. And I believe counsel for the DOJ or -- I'm sorry. Let me strike that.

In your report, did you review any

epidemiological studies involving TCE, PCE, or benzene, for that matter, that postdate EPA's 2020 Risk Assessment for PCE and IARC's 2014 evaluation of PCE, TCE, and other chlorinated solvents?

MS. KONSTANTOPOULOS: Objection to form.

THE WITNESS: Yes, I read multiple studies after those dates, and they're included in the report. Except for Dr. Yu et al., which we've already mentioned.

MR. WALLACE: Okay. Thank you. I have no further questions at this time.

MS. KONSTANTOPOULOS: I have no further questions either.

MR. WALLACE: Okay.

THE WITNESS: Do you have any questions? (Laugh).

THE VIDEOGRAPHER: (Laugh).

The time is 3:41 PM. We're going off the record.

(Signature not waived, the deposition concluded at 3:41 PM.)

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I declare under penalty of perjury that I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save and except for changes and/or corrections, if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

Signed on the _____ day of _____, 2025.

_____

STEPHEN H. CULP, MD, PHD

CERTIFICATE OF REPORTER

COMMONWEALTH OF VIRGINIA )

I, Denise Dobner Vickery, a Registered Court Reporter and Notary Public of the Commonwealth of Virginia, do hereby certify that the witness was first duly sworn by me.

I do further certify that the foregoing is a verbatim transcript of the testimony as taken stenographically by me at the time, place and on the date herein set forth, to the best of my ability.

I do further certify that I am neither a relative nor employee nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such counsel, and that I am not financially interested in the outcome of this action.

DENISE DOBNER VICKERY, CRR-RMR
Notary Public in and for the
Commonwealth of Virginia
Certification No. 0313133
Notary Registration No. 126014

My Commission expires: March 31, 2026

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Federal Rules of Civil Procedure

Rule 30

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(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

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