

Exhibit 596

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
SOUTHERN DIVISION
CASE NO. 7:23-CV-897

IN RE:)
)
CAMP LEJEUNE WATER LITIGATION)
)
)
)
This document relates to:)
)
ALL CASES)
-----)

Videotaped Deposition of PAUL J. MICHAELS, M.D.
Given Remotely
August 6, 2025
8:56 a.m. PST

Reported by: Karen K. Kidwell, RMR, CRR
Job No. 7461308

Videotaped Deposition of Paul J. Michaels, M.D.
held at:

Given Remotely

Pursuant to Notice, when were present on behalf
of the respective parties:

REMOTE APPEARANCES:

On behalf of Plaintiffs Leadership Group:

DIANA GJONAJ, ESQ.
WEITZ & LUXENBERG P.C.
Fisher Building
3011 West Grand Boulevard
24th Floor
Detroit, MI 48202
313.800.4170
dgjonaj@weitzlux.com

On behalf of Plaintiffs Leadership Group:

PATRICK TELAN, ESQ.
RANDOLPH LEE, ESQ.
BELL LEGAL GROUP
219 North Ridge Street
Georgetown, SC 29440
843.546.2408
ptelan@bellllegalgroup.com
rlee@bellllegalgroup.com

On behalf of Defendant United States of America:

ALANNA HORAN, Asst. U.S. Atty.
GIOVANNI ANTONUCCI, Asst. U.S. Atty.
U.S. DEPARTMENT OF JUSTICE
1100 L Street, NW
Washington, DC 20005
202.552.9843
alanna.r.horan@usdoj.gov

Also Present:

David Lane, Videographer

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1 WEDNESDAY, AUGUST 6, 2025

2 P R O C E E D I N G S

3 - - -

4 VIDEOGRAPHER: We are now on the record.
5 My name is David Lane, videographer for Golkow,
6 Veritext Division. Today's date is August 6th,
7 2025, and our time is 8:56 a.m. Pacific time.

8 This remote video deposition is being held
9 in the matter of In Re: Camp Lejeune Water
10 Litigation. Our deponent today is Dr. Paul
11 Michaels.

12 All parties to this deposition are
13 appearing remotely and have agreed to the
14 witness being sworn in remotely. Due to the
15 nature of remote reporting, please pause briefly
16 before speaking so that all parties are heard
17 completely.

18 Counsel, please introduce yourselves and
19 state whom you represent.

20 MS. GJONAJ: Diana Gjonaj, with Weitz &
21 Luxenberg, for Plaintiffs -- Plaintiffs
22 Leadership Group.

23 MS. HORAN: Alanna Horan. I'm here on
24 behalf of the United States, and I'm joined by
25 my colleague, Giovanni Antonucci.

1 VIDEOGRAPHER: Our court reporter today is
2 Karen Kidwell, and will now swear in the
3 witness.

4 PAUL J. MICHAELS, M.D.
5 having agreed to testify under penalties of perjury,
6 testified as follows:

7 EXAMINATION

8 BY MS. HORAN:

9 Q. Good morning, Doctor. Could you please
10 state your full name for the record?

11 A. Paul Joseph Michaels.

12 Q. And could you please state your address
13 for the record?

14 A. It's 4000 Beach Loop Drive, in Bandon,
15 Oregon. And it's 97411.

16 Q. So as I said a moment ago, my name is
17 Alanna Horan; I'm an attorney with the Department of
18 Justice, and I represent the United States in this
19 matter.

20 I thought we might go over some ground
21 rules to kind of start the day, but I do understand
22 you've been deposed before. Correct?

23 A. That's correct.

24 Q. Roughly how many times have you been
25 deposed?

1 A. In the last several years, or ever?

2 Q. Ever.

3 A. Over 50, 60 -- over 60 times.

4 Q. And have all of those 50 to 60 times been
5 in your capacity as an expert witness, or were there
6 times that you were a fact witness, or perhaps a
7 litigant?

8 A. I was never a litigant. I was a fact
9 witness once, about -- a little over a decade ago.

10 Q. And then the other 50 to 60 times you've
11 been deposed, you were an expert witness; is that
12 fair, other than that one fact witness?

13 A. That's correct.

14 Q. And when did you first start working as an
15 expert witness?

16 A. It would have been towards the end of 2007
17 or early 2008.

18 Q. So I think -- sounds like you're well
19 versed in deposition, but we'll go over just a couple
20 of rules so we're on the same page.

21 So, as you are probably aware, the court
22 reporter is here and is writing down everything we
23 say, so it is all taken into the record. To make
24 sure everything gets transcribed properly, I just ask
25 that you answer my questions verbally, as opposed to

1 shaking or nodding your head. Is that fair?

2 A. That's fair.

3 Q. So far, I don't think this will be a
4 concern, but I just ask that you speak at a
5 reasonable pace so the court reporter can get
6 everything down, and I'll do my best to do the same.
7 Is that fair?

8 A. Yes.

9 Q. We are on Zoom. I understand sometimes
10 there are some technical issues. So if you ever
11 don't hear my -- hear my question, or you can't
12 understand it, just please ask me or tell me that,
13 and I will clarify the question. But if you answer a
14 question, I'll assume that you understood it. Is
15 that fair?

16 A. Yes. And I would add to that that I'm in
17 a pretty rural location on the Oregon Coast, and
18 sometimes my Internet may have some issues. And so
19 if that's the case, I will immediately log back on if
20 I lose the connection.

21 Q. Understood. Thank you for the heads-up,
22 and we'll just do our best with the technology that
23 we have available to us today.

24 Again, we're on Zoom. Sometimes this can
25 be a little challenging. But I just ask that you let

1 me finish my question before you begin to answer, and
2 I'll do my best to let you finish your answer before
3 I begin speaking. Is that fair?

4 A. Yes.

5 Q. If you wish to take a break at any point,
6 that's fine with me; I'm happy to do it. If you ask
7 for a break while a question is pending, I just ask
8 that you answer the question before we go on break;
9 fair?

10 A. Yes.

11 Q. Is there any reason why you would be
12 unable to give your most truthful and accurate
13 testimony today?

14 A. No.

15 Q. Throughout the deposition, you may hear
16 your attorney object to some of my questions. Unless
17 your attorney instructs you not to answer the
18 question, I ask that you please answer the question;
19 fair?

20 A. Yes.

21 Q. What did you do today to prepare for your
22 deposition?

23 A. You mean after submitting my report, just
24 to prepare for this deposition?

25 Q. Correct.

1 A. I rereviewed my report. I rereviewed some
2 of the WHO classification tumor books regarding
3 hematopoietic tumors. I rereviewed some of the
4 literature that I cited in my report. I rereviewed
5 some of the other experts' reports that had been
6 issued, that I had reviewed previously. I did an
7 additional literature search, just looking if there
8 was any additional data or reports that had come out
9 since my initially submitted report.

10 Basically that's the extent of what I did.

11 Q. And do you recall what other expert
12 reports you reviewed in preparation for your
13 deposition today?

14 A. I believe Steven Bird -- I think that's
15 his first name -- Dr. Bird, Dr. Reynolds. I --
16 Maslia, Morris Maslia. Dr. -- I'm not sure if I'm
17 getting the last name correct -- Ambinder or
18 Ambinder; one of the Department of Justice expert
19 reports.

20 I think that's mostly it, that I can
21 recall.

22 Q. Did you review Mr. Vidana's deposition
23 transcript in preparation for your deposition today?

24 A. I reviewed parts of it, yes.

25 Q. Did you review any other medical records,

1 or anything of Mr. Vidana's, in preparation for
2 today?

3 A. A few medical records with regard to --
4 surrounding the time of his diagnosis, but mostly I
5 just reviewed my report where I had already
6 summarized the medical records.

7 Q. And in reviewing your report, is there
8 anything you found that -- to be incorrect or
9 incomplete that you would like to amend today?

10 A. Well, one thing that I saw, I think
11 towards the end of my report, I think I put May 12th
12 for the first day that he was in Camp Lejeune, and I
13 think I -- when I was looking at some of, I believe,
14 Dr. Reynolds' data, that May 8th was used. So I
15 wasn't sure about where I got May 12th, or if that
16 was a typographical error or what. But I mean, I --
17 it doesn't change any of the substance of my
18 opinions. So I -- I don't think it's really that
19 important, honestly; it's just a discrepancy that I
20 saw.

21 Q. Anything else?

22 A. Not that I can think of.

23 Q. You said you reviewed parts of
24 Mr. Vidana's deposition transcript. What parts did
25 you review?

1 A. Well, when I first reviewed his deposition
2 transcript in preparation for this litigation, I
3 reviewed the entire thing completely, from page 1 to
4 the end. In this, going back, I wanted to look more
5 at the specifics surrounding his time at Camp
6 Lejeune, what he testified to again.

7 You know, I had mentioned quite a bit of
8 that in my summary, in my report of his deposition
9 transcript, but I just wanted to kind of go through
10 it again and just make sure that everything was
11 consistent with what I had initially written in the
12 report, when I didn't see anything that I got wrong
13 or that I felt like needed to change or supplement,
14 et cetera. It was all kind of consistent with my
15 initial reading and my initial impression of his
16 deposition transcript.

17 Q. So you reviewed the specifics around his
18 time at Camp Lejeune. That was the section of his
19 deposition transcript that you went back and
20 reviewed?

21 A. Right. When he was describing more about,
22 you know, what he did, his day-to-day, Monday through
23 Friday, what he did on the weekends, where he went,
24 things like that.

25 Q. And you found the transcript was

1 consistent with what you had included in your
2 reports, so you don't have any amendments; fair?

3 A. I think that's fair.

4 Q. Did you speak with any attorneys in
5 preparation for your deposition today?

6 A. Yes.

7 Q. I'm not asking about the substance of your
8 conversations, but what attorneys did you speak
9 with -- or which attorneys, I should say.

10 A. Diana Gjonaj. And that was -- that was
11 it.

12 Q. And for how long did you speak with
13 Ms. Gjonaj for?

14 A. I think about a couple of hours over a
15 couple of days.

16 Q. And was that on Zoom, over the phone? How
17 did you communicate?

18 A. Predominantly Zoom.

19 Q. Did you have communications with anyone
20 other than Ms. Gjonaj in preparing for your
21 deposition today?

22 A. Could you repeat that? I'm sorry.

23 Q. Sure. Did you have any communications
24 with anyone other than Ms. Gjonaj, the attorney, to
25 prepare for your deposition today?

1 A. So the only other person is the initial
2 attorney that I spoke with at the very beginning, I
3 believe it was November of last year, in the Chaffin
4 Luhana firm; I think that's their name. And that was
5 Nicholas Farnolo. And I had just sent him an e-mail
6 letting him know --

7 MS. GJONAJ: I'm just going to remind you
8 that anything -- any substance of your
9 communications with counsel is privileged.

10 THE WITNESS: Right. I had just sent him
11 a quick e-mail regarding the date of my
12 deposition.

13 BY MS. HORAN:

14 Q. And Nicholas Farnolo at Chaffin Luhana, is
15 he who you were first in contact with about being an
16 expert in this case?

17 A. Most recently, yes.

18 Q. Who was the first person to contact you
19 about being an expert in this case? Or did you reach
20 out to contact an attorney yourself?

21 A. I didn't reach out to contact anybody.
22 Another attorney from his firm had brought up the
23 litigation to me a couple of years ago, but nothing
24 of any substance occurred at that point with respect
25 to me actually being involved. It was just put on my

1 radar that this is something that their firm is
2 involved with, that I may be asked at some point to
3 review medical records or be involved with the case.

4 But Mr. Farnolo is the only one that I
5 actually talked to specifically regarding this case.

6 Q. Do you work with Chaffin Luhana on other
7 cases?

8 A. I worked with them on one prior case a few
9 years ago.

10 Q. And do you have a retainer agreement with
11 Chaffin Luhana?

12 A. I don't know that I have a retainer
13 agreement with them. They -- back a few years ago,
14 they asked me to -- maybe that's what I signed, just
15 saying what my rate would be; but I don't actually --
16 like I've never -- I've never asked for a retainer,
17 in the sense that I've never asked for money up
18 front.

19 So -- I don't really understand the
20 legalities of -- of things like that. I just know,
21 you know, with regards to retainer, like I've never
22 asked for money up front, I guess I should say. So
23 if I sign something saying that, you know, "Sure I
24 would work with you, but I'm not exclusive to work
25 with you," I don't know if that's considered a

1 retainer agreement.

2 But, you know, that's basically the extent
3 of what I was involved with. And it was not
4 something saying I would work with them or that no
5 question I would be involved in the case. So it's
6 just kind of a -- I think they wanted to just have me
7 available in case they needed me.

8 Q. Sure. Do you remember signing anything
9 called a retainer agreement, engagement letter,
10 contract of any sort that made you available to them?
11 Do you recall signing a document like that?

12 A. I did sign a document, but again, I don't
13 remember the name of that document, and I -- it
14 wasn't anything where any money was exchanged. So --
15 and I reached out to them -- you know, another
16 attorney asking, you know, "Hey, what's going on with
17 this?" And they said, "Oh, we don't really know."

18 And that was a few years -- a couple years
19 ago. Because when I talked to them initially about
20 this litigation, I kind of was under the assumption
21 that it would be occurring kind of quickly. But then
22 I didn't hear anything --

23 MS. GJONAJ: Again, Dr. Michaels, I'll
24 just remind you that you don't have to talk
25 about the substance of your conversations

1 with --

2 THE WITNESS: Okay.

3 So, yeah.

4 MS. HORAN: Sure.

5 So we, Diana, just request a copy of
6 whatever the engagement letter, retainer,
7 whatever we want to call it, the letter that was
8 signed or the agreement that was signed.

9 BY MS. HORAN:

10 Q. And have you ever signed any type of
11 letter, engagement letter, whatever we want to call
12 it, an agreement with the Plaintiffs Leadership Group
13 specifically in regards to testifying on behalf of
14 the Plaintiffs in this litigation?

15 A. I don't believe so.

16 Q. You said you first became aware of this
17 litigation a couple of years ago; fair?

18 A. A few years ago.

19 Q. Do you recall how you first became aware
20 of the litigation? Was it the attorney that you were
21 speaking to that you spoke out a little while ago, or
22 some other way?

23 A. No, I kind of keep up with the news as it
24 relates to medicine, and I kind of started reading
25 about it before I ever spoke with anybody about it,

1 or before it was brought up to me. I never reached
2 out to anybody. But I had kind of known of what was
3 going on for a few years before that. I've kind of
4 heard -- read some articles back in probably the
5 early 2000s, late 20-teens.

6 But -- so that's when I first heard about
7 what was going on. But no details with respect to
8 actual litigation, or that there were attorneys that
9 were taking these cases, or -- or whatever, until a
10 few years ago.

11 Q. And what is your assignment in this
12 matter?

13 A. I don't know what you mean by
14 "assignment."

15 Q. Sure. What were you asked to offer an
16 opinion on?

17 A. Well, I was asked to review Mr. Vidana's
18 medical records and whatever literature I saw
19 appropriate with respect to the case and his medical
20 records and to come to a conclusion, at least as
21 likely as not, if his exposure was potentially a
22 cause for the malignancy that he developed.

23 So I was asked to independently review
24 what I -- the records and the data and come to
25 that -- come to an opinion, and then share that

1 opinion with them.

2 I wasn't biased in -- I mean, I wasn't
3 biased in that they said, you know, "We need you to
4 have this opinion." They want to know -- they wanted
5 to know what my opinion was, because there have
6 been -- in my career, which we've already gone over,
7 of, you know, 18 years, 17 years doing medical, you
8 know, expert witness work, there have been lots of
9 attorneys that know me, that I've worked with firms
10 all over the country, where there are cases where I'm
11 involved with that I may believe in the general
12 causation that a particular exposure leads to a
13 particular disease; but when it comes to
14 case-specific material, there have been multiple
15 times -- at least a dozen -- where I have said "I do
16 not have the opinion that this -- in this particular
17 patient" -- or this particular client, with respect
18 to the attorneys -- "suffered this disease because of
19 their exposure."

20 And so I think I have a reputation with
21 the firms that I've worked with of being
22 independent-minded and coming to my own scientific
23 conclusions, and if that doesn't match with what they
24 are thinking, or their initial hypothesis or theory,
25 then I don't work with them, or maybe they decide to

1 not take the case, or whatever the -- whatever the
2 facts may be.

3 But I was simply asked to evaluate
4 Mr. Vidana's medical records, his deposition
5 transcripts, and whatever scientific articles I could
6 to supplement my opinion in that case.

7 Q. Sure. And you agree that it's important
8 to analyze how a particular individual was exposed to
9 the chemicals in order to determine whether it could
10 have been a cause of their ailment?

11 MS. GJONAJ: Object to form.

12 THE WITNESS: Could you repeat that?

13 BY MS. HORAN:

14 Q. Sure. You agree that it's important to
15 analyze a particular individual's interaction with
16 the chemical in order to determine whether it would
17 be a cause of their ailment?

18 MS. GJONAJ: Same objection.

19 THE WITNESS: Well, I would want to know
20 everything I could about a potential person's
21 exposure to any chemical, in order to feel
22 comfortable -- I guess the amount of -- I guess
23 it would depend.

24 But yes, you want to know what someone's
25 exposure, particular exposure level would be, if

1 it's pertinent to the particular type of
2 exposure and disease that you're dealing with.
3 Because not all carcinogens or exposures are
4 equal, and it depends on the amount of the
5 exposure. It depends on the duration, the
6 particular disease that you're talking about.
7 There's so many variables that you have to look
8 at when, you know, coming to form an opinion
9 based on the weight of the evidence.

10 So I would say, in addition to looking at
11 a particular person's exposure and their
12 particular exposure -- interaction with the
13 chemical, there are multiple other things that
14 you would look at in that context.

15 BY MS. HORAN:

16 Q. Sure. And in preparing your expert report
17 and opinions -- and I'm not asking about attorneys --
18 did anyone help you to prepare your report?

19 A. No.

20 Q. We received a bill that was produced to
21 us that runs through February of 2025, February 1st
22 of 2025, detailing your billable hours on the matter.
23 Do you know what I'm referring to, that bill?

24 A. I believe so, yes.

25 Q. Since February 2025, have you done any

1 work on this case, except for to prepare for your
2 deposition?

3 A. Not except to prepare for the deposition.

4 Q. What percentage of your annual income is
5 earned from serving as an expert witness?

6 A. I would say -- well, it -- you know, of
7 course it would vary, based on the year, and the
8 cases I've worked on. But as a general average --
9 which is really the only way to answer that
10 question -- I would imagine it's around 10 percent.
11 Maybe a little less.

12 Q. You testified that you have been deposed
13 roughly 50 to 60 times. How many times have you
14 testified at a trial?

15 A. Six, I think. Or five. Five or six.

16 Q. Have you ever served as an expert witness
17 for a defendant?

18 A. Yes.

19 Q. What defendant? To the extent you recall.

20 A. Philip Morris.

21 Q. And when was that?

22 A. It's ongoing. And it's been in the last
23 four years.

24 Q. To the extent your opinions have been
25 disclosed into the public sphere -- I don't know if

1 they have -- what are you -- what opinion are you
2 offering in that case on behalf of Philip Morris?

3 A. Well, it depends on the particular patient
4 that I'm asked about, but it's -- they've all been
5 with respect to smoking and whether the malignancy
6 that the particular individual has been diagnosed
7 with was related to smoking.

8 And the cases where I've been involved are
9 cases where, despite the fact that smoking is a
10 significant risk factor for many different cancers
11 and is a known carcinogen for many different cancers,
12 there -- that does not mean that any individual
13 person who is a smoker, that happens to develop a
14 malignancy, has a smoking-related malignancy.

15 And so these have been cases where I've
16 been asked about more than a dozen specific
17 individuals that I suppose have started a lawsuit
18 against Philip Morris, and I'm asked to review their
19 pathology material and their medical records.

20 And although sometimes I've come to the
21 conclusion that yes, smoking was the cause of this
22 particular patient's malignancy, there have been
23 other cases where it was my opinion that it was not.

24 And so that's basically the capacity that
25 I serve in as is a -- a consultant and expert with

1 respect to smoking-related diseases.

2 Q. Other than Philip Morris, can you recall
3 any other defendants you've done work for?

4 A. I don't believe so.

5 Q. So I'm going to -- or Dr. Michaels, do you
6 have any -- do you have your report in front of you?
7 Do you have any documents in front of you today?

8 A. I don't.

9 Q. Okay. So I'm going to share documents on
10 the screen throughout the day. I have them on my
11 desktop. And -- and I'm looking on my iPad, so I
12 apologize if I'm kind of bouncing between the two,
13 but the sound is better this way.

14 So I'll share them kind of throughout the
15 day, if that works.

16 MS. HORAN: Diana, if you have any
17 objection or want to do it differently, please
18 speak up.

19 BY MS. HORAN:

20 Q. But I'll share them throughout the day,
21 kind of -- I understand I'll then have control, so if
22 you ever want me to scroll, or turn to another page
23 or anything, just let me know, and I'm happy to do
24 it.

25 A. Okay.

1 MS. GJONAJ: Alanna, would you also be
2 able to put it in the chat so that we can open
3 the documents?

4 MS. HORAN: Sure. Yeah, I can do that.

5 BY MS. HORAN:

6 Q. Okay, it's loading into the chat.

7 Okay. Dr. Michaels, do you see on your
8 screen a document, "Jose Vidana vs. United States of
9 America, Specific Causation, Expert Report of Paul J.
10 Michaels, M.D."?

11 A. Yes.

12 MS. HORAN: And I'd like to mark this as
13 Exhibit 1.

14 (Exhibit 1 was marked for identification.)

15 BY MS. HORAN:

16 Q. And I'm just going to scroll through it,
17 and I'm going to ask you at the end if it's a
18 complete copy, in your opinion.

19 Dr. Michaels, does this look like a
20 complete copy of the opinions you intend to offer in
21 this case?

22 A. Well, that looks like a -- a complete copy
23 of the report that I issued on February 1st of this
24 year, correct.

25 Q. Sure. And your report includes the

1 opinions you intend to offer in this case, correct?

2 A. Well, insomuch as -- as additional medical
3 journal articles come out, they may, you know,
4 substantiate my opinions, and then I would obviously
5 include all of those in anything that I'm asked in
6 relationship to my report to further elaborate on, I
7 guess I should say, would be summarized within this
8 report, correct.

9 Q. So short of the addition of new literature
10 that comes out after your report was issued, this
11 report is complete in terms of the opinions you
12 intend to offer in this case?

13 A. Well, again, you know, my report -- I
14 agree that my report stands for itself. But this is
15 a 15-page report that talks about several different
16 carcinogens. And I don't go into excruciating detail
17 with respect to the mechanistic mechanisms of the
18 different individual carcinogens and associated with
19 diffuse large B-cell lymphoma or non-Hodgkin's
20 lymphoma.

21 So in the respect that I may be asked
22 about how I form these opinions and, you know, what
23 you took into consideration in evaluating the weight
24 of the evidence, there's not -- it would have to be
25 hundreds of pages to go through all of the details of

1 what I could be asked about.

2 So I'm just trying to be complete in my
3 answer, in that, you know, if someone says, or if you
4 were to ask me, "Well, you didn't talk about the
5 specific mechanism by which TCE or benzene causes
6 genotoxicity with respect to free radicals and" --
7 no, I didn't; but I can discuss that and how that
8 formed my opinion. I just can't include every single
9 underlying fact with respect to carcinogenesis in
10 a -- a report, if that makes sense.

11 Q. Sure. But you're not sitting here today
12 with wholly new opinions that you're intending to
13 offer at trial that are not included in your report;
14 fair?

15 A. That's fair. I don't have wholly new
16 opinions or -- no opinion that would contradict
17 anything that I'm saying in my report.

18 Q. And on the screen right now is your
19 signature next to a date of February 1st, 2025. Do
20 you see that?

21 A. Yes.

22 Q. And so you completed your expert report on
23 February 1st, 2025; fair?

24 A. Yes.

25 MS. HORAN: I'm marking as Exhibit 2 --

1 this is a document, with the first page
2 "February 2025 Expert Report of Paul J.
3 Michaels, M.D." And this says it's an
4 "Additional Materials Considered" list.
5 (Exhibit 2 was marked for identification.)

6 BY MS. HORAN:

7 Q. Do you see that on your screen,
8 Dr. Michaels?

9 A. Yes, I do.

10 Q. Okay. And I'm just going to scroll
11 through this.

12 For the record, we received your original
13 list in February, and then we've since received two
14 additional lists, and those are amended to the back
15 of this.

16 So I'll just scroll through it quickly,
17 and I'm going to ask you at the end whether this
18 looks like a complete list of the materials that
19 you've reviewed.

20 MS. GJONAJ: If I could just mention,
21 she's also dropped that in the chat, so if it's
22 easier for you to scroll and look at these
23 exhibits in the chat . . .

24 THE WITNESS: Okay.

25

1 BY MS. HORAN:

2 Q. Dr. Michaels, does this look like a
3 complete list of the materials you relied on in
4 forming your opinions in this case?

5 A. It does.

6 Q. I am -- I'm showing the last page right
7 now. And do you see the top right says July 30th,
8 2025?

9 A. Yes.

10 Q. Under the section "Expert Materials," you
11 have the four expert reports listed that -- all from
12 April 8th, 2025; that of Dr. Tosic, Dr. Ambinder,
13 Dr. LaKind, and Dr. Bailey. Do you see that?

14 A. Yes.

15 Q. And I believe you mentioned you reviewed
16 Dr. Ambinder's report in preparation for your
17 deposition today. Is that fair?

18 A. Yes.

19 Q. Prior to receiving Dr. Ambinder's report,
20 did you have any knowledge of Dr. Ambinder or -- kind
21 of who he was?

22 A. No.

23 Q. And you filed one report in this matter,
24 correct? You did not file a rebuttal report?

25 A. That's correct.

1 Q. When did you first see Dr. Ambinder's
2 report?

3 A. I don't remember.

4 Q. Do you recall if it was months ago, or
5 like last week?

6 A. It wasn't last week. It was -- the first
7 time I saw it was over a month ago, I think.

8 Q. Going back to the first page, Number 4 on
9 the first page of this exhibit says "Deposition
10 Transcript, Jennifer Leach." Do you see that?

11 A. I do see that.

12 Q. Who is Dr. Leach?

13 A. I don't remember.

14 Q. Okay.

15 A. I didn't rereview that. I did not
16 rereview that deposition transcript in preparation
17 for today, so -- and I don't remember if I mentioned
18 her in my report. I remember mentioning his
19 oncologist, Dr. Mohrbacher. But I don't know if
20 Dr. Leach was his general practitioner. I'm not
21 sure.

22 Q. It's not a trick question. I don't know
23 who Dr. Leach is.

24 A. Yeah.

25 Q. Okay. You also have on this list

1 Dr. Bird's report, which I believe you said you
2 reviewed in preparation for today. Is that correct?

3 A. Yes.

4 Q. Did you review -- well, do you see
5 7 through 11 are the Plaintiffs' general causation
6 expert reports?

7 A. Yes.

8 Q. Did you review those prior to submitting
9 your expert report, or after?

10 A. I believe I reviewed them prior and after.

11 Q. And Number 12 is the specific causation
12 expert report of Dr. Reynolds. Do you recall if you
13 reviewed that prior to submitting your report, or
14 after?

15 A. No. That one would have been after, I
16 believe.

17 Q. Turning back to Exhibit 1 -- I'm going to
18 share it on the screen.

19 And I have page 1 open, although I'm
20 certain you're familiar with your background and
21 qualifications.

22 And you're certified by the American Board
23 of Pathology, correct?

24 A. Yes. In anatomic, clinical, and
25 cytopathology.

1 Q. Do you have any other board
2 certifications?

3 A. Not other than those three.

4 Q. As a pathologist, do you interact directly
5 with patients?

6 A. Yes, on occasion.

7 Q. How often would you say you interact
8 directly with patients?

9 A. Well, it's changed over the years. In my
10 first two practices, before 2021, I did fine-needle
11 aspirations directly on patients in a clinic. And so
12 it would be almost daily that a small part of my day
13 would be seeing patients, evaluating them, taking a
14 clinical history, and then doing a fine-needle
15 aspiration, which is a type of biopsy, on whatever
16 palpable lesion they had that they were referred to
17 my clinic from their other provider.

18 And -- but since I've been in my new
19 practice since January of 2021, I no longer have a
20 fine-needle aspiration clinic, so I don't interact
21 with patients directly, for the most part, except
22 maybe over the phone I get calls from patients asking
23 questions about their lab results or their pathology
24 results, either prompted by themselves or by the
25 referring clinicians that I know in the community.

1 And that's because we have a very good working
2 relationship, and they know that I don't mind and
3 enjoy talking to patients, other than, you know,
4 with -- which is somewhat unusual as a pathologist,
5 who usually don't like to interact with patients.

6 I'm not like that. I get a lot of -- it's
7 very rewarding for me to interact with patients, so I
8 still do over the phone, just not in person, like I
9 did for the first 15 years of my practice.

10 Q. And I understand at a high level, but --
11 at a high level, your job as a pathologist is to look
12 at various tissues and determine if there is any type
13 of disease in that tissue. Is that fair?

14 A. I would say that's one of my high-level
15 jobs as a pathologist.

16 Q. What are your other high-level jobs as a
17 pathologist?

18 A. Well, I not only look at tissue, but a
19 part of -- that's anatomic pathology. I also, as you
20 mentioned, am board-certified in clinical pathology,
21 which has to do with laboratory testing, transfusion
22 medicine, microbiology. So -- and I'm the chairman
23 of the department, so I am intimately involved in
24 laboratory testing and blood product issuing in
25 the -- the hospital. I am the chair of the cancer

1 committee and a member of the medical executive
2 committee of the hospital, so I deal with a lot of
3 administration with respect to our cancer center
4 coordination and accreditation.

5 So I'm also an active teacher and a
6 clinical assistant professor of pathology at OHSU,
7 which is Oregon Health and Sciences University, in
8 Portland. I was just there less than a week ago, in
9 person, teaching the pathology residents, which I do
10 monthly for the last three years.

11 So I -- I would say I have a lot of --
12 those are all kind of various high-level aspects to
13 my job as a pathologist.

14 Q. Sure. And when patients call you, I think
15 you said they call you to talk about findings that
16 you've had in your report related to diseases they
17 have; is that fair?

18 A. Often, yes, that's correct.

19 Q. Your report says that you have a strong
20 subspecialty focus in breast and gynecological
21 pathology. Is that fair?

22 A. That's one of my subspecialty focuses,
23 that's correct.

24 Q. And you currently work for Pathology
25 Consultants; is that right?

1 A. Yes.

2 Q. And is -- you work at a hospital as well,
3 though, correct? So you're in a hospital environment
4 for your day-to-day job?

5 A. Yes.

6 Q. Does the hospital pay you, or does
7 Pathology Consultants pay you?

8 A. So the hospital pays us for a medical
9 director fee that's I think paid monthly. And that
10 is paid not to me directly, but to Pathology
11 Consultants. And then we are then paid a salary,
12 with bonuses, from Pathology Consultants.

13 So I am not paid directly by the hospital.
14 I don't get anything from the hospital. There have
15 been other places I've been at where, when you're on
16 the medical executive committee, the hospital, around
17 Christmastime, or whatever, will give you a gift or a
18 gift card or something; that does not occur here.
19 It's a rural hospital without a lot of money. So we
20 only get paid, my colleague and I, as -- salary and
21 bonuses from Pathology Consultants directly.

22 Q. And how many pathologists work at your
23 hospital?

24 A. Two.

25 Q. Are they both part of Pathology

1 Consultants?

2 A. Well, I'm one of them, and the other one
3 is as well.

4 Q. So on this first page, in the second
5 paragraph, near the end, it says "During my career, I
6 have had a strong subspecialty focus in breast and
7 gynecological pathology as well as cytopathology, but
8 have routinely been considered by my colleagues to be
9 an expert in the diagnosis of disease processes and
10 cancer throughout all organ systems, often serving as
11 one of the main internal consultants for challenging
12 tumors, including hematopoietic neoplasms."

13 When you say in that sentence "main
14 internal consultants," are you referring to you and
15 your colleague who works at the hospital with you?
16 Or who are you -- who are the consultants -- who are
17 you referring to?

18 A. Right. So any -- not just the -- my
19 current colleague, who gives me actually all of his
20 lymphomas, because he's not comfortable signing out
21 hematopoietic system malignancies or reactive
22 processes, so I actually sign out 100 percent of any
23 of the lymphomas that come out of my hospital
24 directly.

25 But in the past, you know, my prior group,

1 from 2012 until 2020, I was one of 50 pathologists,
2 and I would get cases from multiple pathologists for
3 my expert opinion, including other
4 hematopathologists, who are board certified in
5 hematopathology, asking me for my opinion on
6 interesting or unusual lymphomas, or, you know,
7 reactive lymph node proliferations.

8 Same with before that, in Las Vegas, from
9 2006 until I left at the end of 2012, it was the same
10 thing: That I was one of about 20 pathologists,
11 towards the end, and I would get cases from all over
12 Southern Nevada, as well as Western Arizona, which we
13 had pathologists there, that would -- knew my
14 expertise as a pathologist and would ask me for my
15 opinion.

16 So it's been all throughout my career, not
17 just limited to my one colleague that I currently
18 have.

19 Q. So why would someone -- or strike that.

20 What specialty and training do you have in
21 diagnosing hematopoietic neoplasms or non-Hodgkin's
22 lymphoma that would lead colleagues who specialize in
23 it to come talk to you about a diagnosis?

24 A. Because I'm --

25 MS. GJONAJ: Object to form.

1 THE WITNESS: I'm a really good diagnostic
2 pathologist. And I trained at an institution,
3 Massachusetts General Hospital, where we had
4 some of the best world-renowned
5 hematopathologists. So just because I didn't do
6 a fellowship in it, I did a lot of extra work
7 day to day, as a resident, in hematopathology.

8 And so -- and that comes across. When you
9 interact with different pathologists, you get to
10 know what they're good at, you know, what they
11 have a good eye for. There have been several
12 cases where I've had a -- what I thought was
13 a -- a lymphoma of a salivary gland -- this was
14 early in my career, in Austin, Texas, at
15 Clinical Pathology Associates -- where I showed
16 it to another hematopathologist, and I said, "I
17 think this is a lymphoma." You know, "Do you
18 agree?"

19 Because any new malignancy -- every group
20 I've ever been in, any new malignancy, we have a
21 rule or a protocol where we have another
22 pathologist agree, typically before you release
23 the case and sign out the case into the computer
24 system for the patient and the provider to
25 receive. It just is a quality assurance measure

1 to make sure that we have two people agreeing
2 for a new malignancy.

3 And so I would have several cases like
4 that that were assigned to me that no one knew
5 was going to be a lymphoma. I get the case. It
6 looks like lymphoma. I work it up. And once I
7 was done working it up, I would show a
8 hematopathologist. And there have been several
9 times where a hematopathologist would disagree
10 with me. And I would look at it again,
11 thinking, "Well, maybe I was wrong. Let me look
12 at this case again."

13 I'd look at it again. I'm like "No, I
14 think this is -- this type of lymphoma," or
15 whatever. And either we would send it out for
16 molecular testing, or get an additional sample
17 for flow cytometry, or send it to an outside
18 expert pathologist, like Nancy Harris or Judith
19 Ferry at Massachusetts General Hospital, or
20 whoever the hematopathologist would be
21 throughout the country, and they would agree
22 with me.

23 So then the hematopathologist would think,
24 "Oh. Well, boy, you know, Paul Michaels was
25 right, and I was wrong about that case."

1 And so when that happens enough, those
2 hematopathologists, regardless of the fact that
3 I'm not fellowship-trained or board-certified in
4 that particular subspecialty, would come to me
5 with their difficult cases, knowing historically
6 that I am a good diagnostic pathologist in all
7 aspects, including hematopathology.

8 BY MS. HORAN:

9 Q. And I believe you said that in your
10 current role, you deal with 100 percent of the
11 hematopoietic neoplasms that come through the
12 hospital; is that right?

13 A. When I'm working, that's correct, yes.

14 Q. And in your current role, how often do you
15 diagnose NHL?

16 A. Once a week.

17 Q. And in your current role, how often do you
18 diagnose diffuse large B-cell lymphoma?

19 A. Once a month.

20 Q. Just putting those numbers together,
21 roughly 25 percent of the cases of NHL that you
22 diagnose are diffuse large B-cell lymphoma, in your
23 current --

24 A. I would say that's about right.

25 Q. In your current practice, how often do you

1 come to a conclusion about what caused that
2 individual's non-Hodgkin's lymphoma or diffuse large
3 B-cell lymphoma?

4 MS. GJONAJ: Object to form.

5 THE WITNESS: Well, it depends on -- it
6 depends on the type of lymphoma. So I couldn't
7 give a percentage, but I would say frequently.

8 BY MS. HORAN:

9 Q. So frequently, you come to a conclusion in
10 your practice today about what caused someone's
11 non-Hodgkin's lymphoma or diffuse large B-cell
12 lymphoma?

13 MS. GJONAJ: Object to form.

14 THE WITNESS: Yes, depending on the access
15 I have to medical records, I would say that's
16 certainly more common in that aspect, in that
17 situation, than when I get a non-Hodgkin's
18 lymphoma from an outside hospital that we don't
19 have access to their medical records.

20 BY MS. HORAN:

21 Q. How often do you deal with a non-Hodgkin's
22 lymphoma from an outside source, where you don't have
23 access to their medical records?

24 A. Not often. I would say that's a minority
25 of the time. Maybe 10 percent.

1 Q. So is it your standard practice that if
2 you determine someone's been diagnosed with NHL, that
3 you try to determine their cause of the NHL?

4 A. As part -- yes, in the sense that as part
5 of the subclassification system, which is now often
6 defined by etiologies and defined by the scenario
7 which the malignancy -- specifically a non-Hodgkin's
8 lymphoma, and even more specifically diffuse large
9 B-cell lymphoma arises within, I make a -- a strong
10 effort to rule out or rule in any particular known
11 etiologic causal risk factors.

12 There have been cases where -- not long
13 ago, there was an oncologist who had a patient
14 biopsied; there was a diffuse large B-cell lymphoma
15 that I worked up and did, as part of my routine
16 panel, EBV -- Epstein-Barr virus -- in situ
17 hybridization, and it was positive.

18 And he was an older gentleman. And I
19 called that oncologist, and I told her, you know,
20 "This is EBV positive. This could be an
21 EBV-associated diffuse large B-cell lymphoma. I
22 would test this patient for HIV."

23 Because he had no other known risk factors
24 that were causing him to be immunodeficient according
25 to the medical records. But a lot of EBV-associated

1 diffuse large B-cell lymphomas arise in the setting
2 of immunodeficiency. And one of the biggest acquired
3 immunodeficiencies is based on HIV infection. And so
4 she did an HIV test and a viral load, and his
5 antibody was positive, and his viral load was off the
6 charts.

7 So that has a huge implication for the
8 prognosis and treatment of that patient, because
9 treating him for his underlying HIV would
10 dramatically improve his prognosis. And because so
11 many aspects of disease and cancer in general, but
12 even more specifically now the WHO, Fifth Edition,
13 Classification of Hematopoietic Tumours, and
14 especially B-cell lymphomas, really depend on
15 identifying a potential etiology that could be
16 altering the treatment or prognosis, I make a strong
17 effort to do that in all of my cases.

18 Now, you're not always successful, and
19 sometimes the clinical history is limited, or the
20 clinician that actually did the questioning and the
21 intake for the patient did not do an extensive review
22 of all potential etiologies that the person could be
23 exposed to; so you would be limited, in a case like
24 that, to -- to do whatever you could with respect to,
25 you know, established risk factors and the --

1 determining any sort of established risk factor.

2 But, you know, these are things we discuss
3 in tumor board, and they are things that I do
4 routinely with my cases.

5 Q. Do you need to know an individual's
6 medical history and risk factors in order to be able
7 to diagnose NHL or a diffuse large B-cell lymphoma?

8 A. Well, again, it depends. Some of them are
9 defined -- some of the diffuse large B-cell lymphomas
10 are defined by the clinical history and how they
11 arose.

12 Like if I just got a biopsy of a soft
13 tissue mass, let's say in the hip, and it looks like
14 a diffuse large B-cell lymphoma, if I didn't know
15 anything, I couldn't be more specific other than to
16 say "This is diffuse large B-cell lymphoma NOS,"
17 which means not otherwise specified.

18 But in a case like that, what I do would
19 be to review the clinical history in more detail,
20 contact the radiologist that did the biopsy, find out
21 if this patient has known chronic osteomyelitis in
22 that bone that was biopsied, or if it's the soft
23 tissue. Is there a chronic mesh implant or metallic
24 foreign body hardware? Because there's now a new
25 classification that has diffuse large B-cell lymphoma

1 associated with chronic inflammation that arises in
2 those settings, and clinicians often treat these
3 cases differently. So because of that, and because
4 this classification system is evolving, that's
5 exactly why I attempt to find out any more clinical
6 history.

7 Now, sometimes you can't. And you contact
8 the clinician, and they don't know anything about the
9 patient. The patient was just referred to them. You
10 know, we're a big retirement area. I'm in the
11 Southern Coast of Oregon. It's -- a lot of people
12 move here from other places when they retire, and so
13 a lot of times people come just recently, and
14 started, you know, access to care here, and we have
15 no records. And a lot of patients aren't -- aren't
16 vigilant about keeping their prior medical records.
17 And so sometimes I'm limited, and I just do the best
18 I can in those cases.

19 But ideally, you want to find out as much
20 as you can to do a good clinical pathologic
21 correlation, not just for the sake of doing it, but
22 for the sake of good patient care and good, you know,
23 health care.

24 Q. Do you include, like in your pathology
25 report, what you believe the cause of the ailment is?

1 Or where do you -- is it routinely a part of your
2 form, I guess, that you would provide?

3 A. If -- if it's identified, yes, because
4 that changes the subclassification.

5 And in the case of that patient I was
6 talking about recently, with the diffuse large B-cell
7 lymphoma that was HIV-associated, I did not know. It
8 took several days for the oncologist to see the
9 patient to do the testing. I wasn't going to wait to
10 release the case before that.

11 So I added a comment, and I do that
12 routinely in my malignancies, where I add a comment
13 varying in length, depending on the malignancy,
14 saying, "This was my -- you know, this is what the
15 findings are. This is what this means. This means
16 that this person may be immunodeficient so testing
17 for various viruses or other causes of an acquired
18 immunodeficiency would be indicated in this case."

19 So I will routinely put that in a comment.

20 Q. Of the non-Hodgkin's lymphoma cases that
21 you've diagnosed, what percentage of them have you
22 been able to determine the cause of?

23 A. I would say -- as I said earlier, I would
24 say it's frequently; but as far as percentage, I
25 would say less than half. But it depends on my

1 access to the medical records.

2 Q. And in your practice, how often have you
3 been able to determine the cause of someone's diffuse
4 large B-cell lymphoma?

5 A. Again, it would -- it would depend on --
6 the more history I'm given, the more access I am to
7 detailed medical records, the higher that percentage
8 would be.

9 So it would really just depend on the
10 particular case. I don't think I could give a -- I
11 don't think I could accurately give a percentage,
12 because it's so dependent on the other factors that I
13 may or may not have access to.

14 Q. Have you ever sought an interview with a
15 patient in order to find out something about their
16 medical history in order to determine the cause of
17 their NHL?

18 MS. GJONAJ: Object to form.

19 Sorry. I didn't realize I was on mute.

20 THE WITNESS: Could you repeat that? I'm
21 sorry.

22 BY MS. HORAN:

23 Q. Sure. Have you ever sought to interview a
24 patient to ask them questions about their medical
25 history in order to determine the cause of their NHL?

1 A. There have been cases where I have
2 asked -- I guess the answer would be yes, because
3 there have been cases in the last several years where
4 I have asked the clinician who ordered the biopsy if
5 they could go back and ask the patient X, Y, and Z
6 question, which is what I typically do. And I always
7 offer: "If you'd rather, I can talk to the patient."

8 Now, most of the clinicians that I deal
9 with would rather talk to them themselves. And so --
10 but I have -- in that sense, I have sought to
11 interview them, or to ask them additional questions.
12 I guess -- but usually what happens is those
13 providers that ordered the biopsy that I have then
14 reviewed will then go and ask the patient the
15 questions that I have posed that I don't have access
16 to.

17 Q. So when you're reviewing someone's NHL and
18 trying to determine the causation, what are the risk
19 factors you look for?

20 A. Well, with respect to ones that I'm
21 concerned about -- like there are multiple risk
22 factors for different non-Hodgkin's lymphomas. With
23 respect to diffuse large B-cell, the ones that I'm
24 most concerned about, that I can basically -- you
25 know, that would affect my report, I should say,

1 would be any sort of genetic susceptibility. So like
2 Li-Fraumeni syndrome, which is a mutation in the
3 gene TP53, which causes a -- a syndrome called
4 Li-Fraumeni -- L-i, Li-Fraumeni -- that would give
5 rise to multiple malignancies, including lymphomas,
6 and leukemias. Any sort of inherited
7 immunodeficiency states -- and this would be more
8 often for younger patients, like DiGeorge syndrome or
9 any other T-cell or B-cell, like chronic -- or common
10 variability immunodeficiency, CVID.

11 If the patient's had an organ
12 transplant -- because a lot of times we have
13 patients -- we don't do organ transplants locally,
14 but we have patients that, as I mentioned, come here
15 and have had organ transplants that are then followed
16 here.

17 And that would again change my diagnosis,
18 because if it looks like a diffuse large B-cell
19 lymphoma, and I don't know that the patient's had a
20 transplant, and I call it diffuse large B-cell
21 lymphoma as my top-line diagnosis, I'm wrong.
22 Because that's a -- that's a type of post transplant
23 lymphoma disorder, PTLD, which should be classified
24 as such, and then subclassified by there as a large
25 B-cell lymphoma. But that would affect what I do.

1 Any sort of autoimmune condition is
2 another causal risk factor. So like lupus, Sjögren's
3 syndrome, rheumatoid arthritis; that would change how
4 my diagnosis is.

5 And again, this is all based on the new
6 classification system. Patients that have had a long
7 standing effusion, whether it's pericardial or
8 pleural or peritoneal, those would be considered
9 fluid overload-associated.

10 Diffuse large B-cell lymphomas which is a
11 separate category. If they have any sort of pseudo
12 cyst in their body, like around the pancreas or
13 somewhere elsewhere, where they have -- fibrin
14 develops within a pseudocyst; those are
15 fibrin-associated diffuse large B-cell lymphomas.

16 Again, for diffuse large B-cell lymphoma
17 and the Hodgkin lymphoma in general, various
18 infections, so -- I already mentioned HIV. HHD8,
19 which is human herpesvirus 8, causes some diffuse
20 large B-cell lymphomas and other malignancies like
21 Kaposi's sarcoma. It causes some nonmalignant
22 lymphoid proliferations, like plasma cell variant of
23 Castleman's disease. There's hepatitis C, is a risk
24 factor, a causal risk factor for non-Hodgkin
25 lymphoma, including diffuse large B-cell and

1 hepatitis B also.

2 And I think helicobacter pylori in the
3 stomach causes an extranodal marginal zone lymphoma
4 which is -- the other name is MALT lymphoma, M-A-L-T,
5 which stands for mucosa-associated lymphoid tissue
6 lymphoma.

7 So those give that lymphoma which can then
8 progress into a diffuse large B-cell lymphoma. So in
9 that case, helicobacter pylori would be an example of
10 a causal risk factor in that setting.

11 I think that's predominantly what I can
12 think of, off the top of my head.

13 Q. Do you -- or strike that.

14 How often do you tell a patient that it's
15 impossible to know the cause of their NHL with any
16 certainty?

17 MS. GJONAJ: Object to form.

18 THE WITNESS: How often -- I've not really
19 been approached with that situation, where I've
20 been asked that. There aren't many things
21 where, you know, you can ever be 100 percent
22 certain with anything. I think, you know, you
23 just have to give your overall opinion, based on
24 a particular patient's clinical history and
25 presentation, and their specific histologic

1 subtype, to come to any sort of conclusion; but
2 usually it's not with 100 percent certainty.

3 BY MS. HORAN:

4 Q. Sure. How often -- setting aside the
5 certainty-question piece of that, how often do you
6 tell a patient you don't know the cause of their NHL?

7 MS. GJONAJ: Object to form.

8 BY MS. HORAN:

9 Q. Or put it in the form, or however you
10 communicate it to their physician?

11 A. I don't know that I'd be able to have a
12 way to quantify that, because, you know, I'm not
13 usually asked that, and in that context. When I've
14 seen patients in the past, most of the time it's in
15 the setting of initial diagnosis. And I, as a
16 routine, did not give patients directly a new
17 diagnosis of a malignancy, because I did not think it
18 was appropriate for me, as my role as the
19 diagnostician in that particular instance where a
20 patient came to my clinic, to then elaborate on what
21 their actual diagnosis is, even though oftentimes I
22 knew it before they left my office.

23 Because the -- the general timeline is
24 that I would interview a patient; I would biopsy the
25 patient with one pass of the needle; I would go in

1 the next room, stain that, take a look at it under
2 the microscope, under the assumption that I was doing
3 that to make sure I had an adequate sample so the
4 patient didn't have to come back. And that is why I
5 did it.

6 But at the same time, oftentimes I knew
7 the diagnosis. And if it was malignant, I did not go
8 back in that room and say, "Guess what? It's
9 malignancy. It looks like you have a lymphoma." And
10 even in that case, you can never -- almost never
11 subtype a lymphoma based on a fine-needle aspiration,
12 especially immediately, on a rapid, immediate
13 assessment.

14 And so I was never really posed that
15 particular situation with any malignancy. I've been
16 posed that with multiple other types of tumors, but
17 not with -- specifically with a lymphoma where I've
18 had to have that conversation with a patient.

19 Q. So I just want to make sure we're on the
20 same page. I'm not asking about telling a patient
21 their diagnoses, or a subtype, or what the actual
22 diagnosis is. I'm wondering how often, when you
23 determine there's an NHL, do you determine that
24 there's no known cause of that NHL?

25 MS. GJONAJ: Object to form.

1 BY MS. HORAN:

2 Q. Tell them or their -- their physician, if
3 you do it through the form or however you do it, that
4 "This is the diagnosis. I don't know why this
5 individual developed NHL."

6 A. So again, I -- I feel like you asked me
7 that question, and I said it would depend on the
8 particular type of NHL. It would depend on how much
9 I had access to the medical records. Sometimes these
10 conversations also take place in tumor board, where
11 we go into more depth about a patient's risk factors
12 and potential causes, and elaborate more in that
13 setting.

14 So I don't think I could give you -- as I
15 said before, I -- I frequently do -- I don't think I
16 could give you a percentage, because the denominator
17 is so varied.

18 Q. You listed a number of risk factors for a
19 diffuse large B-cell lymphoma -- and I apologize.
20 We've been going over an hour. Would you like a
21 break? Are you okay to keep going?

22 A. I'm okay.

23 Q. Okay. You listed a number of risk factors
24 earlier for the development of diffuse large B-cell
25 lymphoma that you would look to to try to understand

1 the cause of -- of a disease.

2 Do you ever ask or inquire into whether an
3 individual in your practice was exposed to TCE, PCE,
4 or benzene in determining cause of their NHL?

5 A. Only to the extent that I ask that -- I
6 will look for specific environment exposures;
7 patient -- the patient's work history, et cetera.
8 And that would -- that wouldn't necessarily change my
9 diagnosis, because none of the diagnoses are defined
10 by chemical or carcinogen exposure, necessarily; but
11 it would help confirm or at least support my opinion
12 that I am dealing with a malignancy, because
13 sometimes it is difficult on small biopsies to know
14 what you're dealing with.

15 And if I know that there's that history
16 of, you know, pesticide exposure, chemical plant
17 exposure, whatever the type of chemical exposure
18 would be, based on a patient's work history or
19 occupational exposure level, that does help form my
20 opinions, but it wouldn't necessarily change the
21 diagnosis. But it is information that I find useful.

22 Q. Have you ever -- I think you said you
23 mostly communicate the cause via a form, but -- via
24 the form that you sign, or the -- via communications
25 directly with the patient or their doctor.

1 Have you ever noted that the cause of
2 someone's NHL was, in your view, due to -- due to a
3 chemical exposure, from their work history?

4 MS. GJONAJ: Object to form.

5 THE WITNESS: Well, again, it's usually --
6 those kinds of questions and those kinds of
7 evaluations often come -- or happen in the
8 context of tumor boards or direct clinician
9 conversations. And they often occur after
10 molecular testing has been performed, in some
11 cases, depending on whether it's a bone marrow
12 biopsy or things like that because, you know, a
13 treatment and a cause of some hematopoietic
14 tumors is chemotherapy, which is a type of toxic
15 chemical.

16 And oftentimes a patient has gotten
17 chemotherapy for one malignancy and then
18 develops a new malignancy that's some type of
19 either myelodysplasia, or myeloproliferative
20 disorder, or leukemia, or non-Hodgkin lymphoma.
21 And based on the molecular testing, if it's a
22 complex karyotype, that suggests to me that it
23 would be related to some sort of toxic exposure
24 like a chemotherapy in that case.

25 So there have certainly been cases where,

1 based on the molecular genetics and based on a
2 patient's particular exposure history, where
3 we've had that conversation; and sometimes
4 that's put into a comment, or with some of
5 these, you know, treatment-associated
6 malignancies into the actual diagnosis.

7 But typically that's a conversation that's
8 had between the pathologist -- in case, me --
9 and the clinician -- usually an oncologist --
10 who kind of is the one that's going to be
11 treating that patient and is more aware of their
12 exposure and risk-factor history with respect to
13 the malignancy that they're treating them for.

14 BY MS. HORAN:

15 Q. In your practice, to the best of your
16 knowledge, have you ever -- well, strike that.

17 A pathologist is part of a -- a patient's
18 treatment team? Or how would you describe your --
19 are you part of the care team? I don't -- I want to
20 use the word that you would consider yourself to be:
21 A medical team? I don't know kind of what -- what
22 word you use.

23 A. Yeah, I think "medical team." I mean, you
24 could use any of that. I mean, obviously I don't do
25 any of the treatment myself, but the treatment

1 depends on my diagnosis, so you could consider me
2 part of the, you know, medical team, treatment team.
3 I think any of that sounds -- is fine.

4 Q. Okay. In your practice, and to the best
5 of your knowledge, have you been part of the medical
6 team of a patient that was diagnosed with NHL that
7 was at Camp Lejeune between 1953 and 1987?

8 MS. GJONAJ: Object to form.

9 THE WITNESS: Not that I've known of.

10 BY MS. HORAN:

11 Q. Have you discussed Camp Lejeune with,
12 directly, any of your patients, or any of their
13 oncologists that you communicate about their
14 diagnoses with?

15 A. I don't believe so.

16 Q. Have you ever asked an oncologist to
17 inquire whether an individual was at Camp Lejeune
18 between 1953 and 1987?

19 A. Not specifically, no.

20 Q. Outside of this litigation, has anyone
21 asked you if their non-Hodgkin's lymphoma was caused
22 by exposure to water at Camp Lejeune?

23 A. I don't believe so, no.

24 Q. One of the things you mentioned earlier
25 was -- correct me if I'm saying this wrong -- but you

1 don't diagnose someone by their chemical exposure,
2 but you might take into consideration that someone
3 worked on a -- with pesticides, or at a chemical
4 plant. Am I repeating you correctly?

5 A. Well, it's -- I would say it's not that
6 I -- I wouldn't say that I don't diagnose them based
7 on their chemical exposure. It's one of the aspects
8 of their clinical history that I would take into
9 account, but depending on the malignancy, not
10 necessarily change the diagnosis that's on the
11 pathology report.

12 Q. Sure. And there are no biomarkers for TCE
13 or PCE or benzene which would indicate that an NHL
14 had developed in light of exposure to any of those
15 chemicals; fair?

16 A. Not with any specificity. I would say
17 that's fair.

18 Q. If you saw a patient who had an NHL and
19 had a work history as an individual who worked at a
20 chemical plant, what other types of things would you
21 want to know about their chemical exposure in order
22 to determine if that might have been a cause of their
23 NHL?

24 MS. GJONAJ: Object to form.

25 THE WITNESS: So in those cases where that

1 has actually been the case, I would want to know
2 when that -- when it was, when their exposure
3 history started, and what their role was with
4 respect to chemicals.

5 Those would be the main things that I
6 would ask. I wouldn't ask -- again, because it
7 wouldn't -- in that particular context, when
8 we're dealing with, you know, how we're going to
9 treat the patient and how we're going to assess
10 their prognosis, those things aren't really, for
11 the most part, going to play a huge role, so
12 it's not typically on the forefront.

13 If we've determined that it's likely based
14 on a chemical exposure, except for if they're
15 still currently in that exposure situation, then
16 you want to minimize any future exposure. So I
17 would say a timeline of, you know, when they
18 started working and when they -- what their role
19 is in that context.

20 BY MS. HORAN:

21 Q. And why would you want to know what their
22 role was?

23 A. Well, if it's someone who was, let's say,
24 a transcriptionist or a secretary and didn't
25 actually -- you know, at a tire factory plant, and

1 they weren't ever in the factory, and they were off
2 site, then I'd say, "Okay, well, that's -- that's a
3 red herring. Just because they're a tire factory
4 worker doesn't mean that her bladder cancer is from
5 that, or her lymphoma was from that."

6 It would -- you know, I would -- you know,
7 not kind of -- I would still be -- and I would
8 anyway -- looking for other etiologies and think
9 that's less likely to be associated with this
10 malignancy.

11 And as far as timeline, it would be, you
12 know, if someone was diagnosed with -- you know,
13 let's say an individual was diagnosed with a low
14 grade B-cell lymphoma type of a non-Hodgkin lymphoma
15 and they had only been exposed at a particular job
16 site for a year, but yet when you go back to prior
17 CAT scans, you could see in large lymph nodes two
18 years before, that were just kind of missed or maybe
19 thought to be reactive, but eventually they were
20 diagnosed as malignant.

21 Well, the temporality in that wouldn't
22 make sense. So even though they were exposed to a
23 particular chemical, and maybe had a high level of
24 exposure, if the malignancy was there before the
25 exposure, then there's really not a significant

1 association in that case.

2 So those are things that I would kind of
3 look for.

4 Q. Sure. And just to go back to your tire
5 factory example, you -- you're looking to understand
6 what the individual's actual interaction with the
7 particular chemical was, when you asked them, and try
8 to determine whether that chemical would have been
9 the cause of their -- or the likely cause of their
10 NHL?

11 A. Yeah, in the sense of -- if someone was
12 always off site, like I said, and not actually in the
13 factory, and they were in an off-site building, that
14 they technically worked for a tire factory company or
15 a -- you know, gasoline company or, you know,
16 refinement industry, whatever; but if it's someone
17 that -- oh, they were a -- they were a courier, and
18 they were usually in their car, but, you know, spent
19 some time, you know, exposed to those chemicals when
20 they were going through the factory to pick up mail
21 or something, that would still be significant.

22 It wouldn't have to necessarily be someone
23 that was working on the factory line that was exposed
24 all the time, because when you're dealing with these
25 mutagenic, clastogenic, genotoxic substances, that

1 kind of exposure is significant, even if it's
2 short-term. But if it's someone who was never
3 exposed and was never in an area that would have ever
4 been considered exposed to those chemicals, then that
5 would be something that would -- you know, I would
6 take into account when forming my opinions. If that
7 makes sense.

8 Q. Sure. So in the context of a factory
9 worker, if they're -- you're -- you're trying to
10 determine in a binary manner if they were exposed or
11 not? Or are you looking for kind of the amount of
12 exposure?

13 A. Well, you know, in any given diagnostic
14 pathology report, if I'm not asked to kind of opine
15 to that, then I would do it more as an academic
16 setting, and say, "Oh, you know, it's likely that,
17 you know, you don't need to go looking for all these
18 other autoimmune diseases in this patient." You
19 don't need to go looking for -- necessarily for
20 esoteric infections. HTLV is another infection that
21 can cause lymphomas, but -- like you don't need to go
22 looking for, you know, or assume that you missed
23 another infection, et cetera.

24 Like it's -- it's one thing that you take
25 into consideration with respect to, you know,

1 evaluating or coming to an opinion on any sort of
2 etiologic cause, which is not done as much as it
3 should be in medicine, because prevention is
4 extremely important; and if someone has a continued
5 exposure to something, and they are known to develop
6 a malignancy that is, you know, noted to be
7 associated with that exposure, that exposure needs to
8 be eliminated as much as possible.

9 And that's the real reason why you go
10 through that -- that process and why you go through
11 that, you know, kind of algorithm, to figure out what
12 a cause would be for a malignancy.

13 It's similar to women that develop breast
14 cancer and were on hormone replacement therapy. If
15 you didn't go to the trouble of finding out -- "Oh,
16 they were on hormone replacement therapy," you
17 wouldn't know to tell them to stop it, if they have a
18 hormone-positive tumor.

19 So it's that kind of analysis that is
20 important in medicine. It goes a step beyond what
21 maybe some physicians do in their general practice,
22 but it's what I strive to do in mine.

23 Q. Sure. Back to your rubber tire factory
24 example that you were using before. I believe you
25 said that if the person was a secretary and never had

1 any exposure to the actual factory floor, then you
2 would not conclude that just the fact that they
3 worked at the factory, that that was -- the chemicals
4 in the factory were the cause of their NHL. Am I
5 understanding that correctly?

6 MS. GJONAJ: Object to form.

7 THE WITNESS: Again, it would depend on
8 the particular circumstances where -- like I
9 said, if they were off site and nowhere near the
10 factory and they never had any exposure to the
11 factory workers or the products that went
12 through, yeah, that would -- that would be
13 different in that hypothetical example.

14 BY MS. HORAN:

15 Q. And in that same example, if someone said
16 they did work in the factory, would you want that
17 same analysis to understand how they interacted with
18 the chemicals, and how much chemicals they interacted
19 with, in order to determine that their exposure was
20 the likely cause of their NHL? Or would you --
21 would -- does the fact that they had been exposed at
22 the factory be sufficient for you to determine that
23 it was the likely cause?

24 MS. GJONAJ: Object to form.

25 THE WITNESS: Well, again --

1 BY MS. HORAN:

2 Q. Strike that.

3 I guess my -- would you be interested in
4 kind of the amount that they were exposed to, or
5 would it just -- is it just a -- a matter if they
6 were exposed?

7 MS. GJONAJ: Same objection.

8 THE WITNESS: Again, it would depend on
9 what you're talking about, the exact exposure.
10 And, you know, I think several times you said
11 "the likely cause," which, you know, I would
12 think of it more as a cause, or a contributing
13 cause, that you could opine based on, again, the
14 weight of the evidence.

15 If you -- if I was asked to opine on that
16 by a clinician, I would say that exposure would
17 be a likely cause; but you do want -- you know,
18 there's -- we're talking about things that --
19 that, you know, maybe not necessarily have known
20 thresholds, because you can't really,
21 realistically, with a carcinogen, do any sort of
22 ethical randomized control trial to establish a
23 threshold, which I feel like it's what you're
24 getting at with extent of exposure.

25 All you can do is go based on, you know,

1 observational studies that have looked at a
2 particular disease occurring at a particular
3 exposure level. So -- and that's not something
4 that is done day to day in a pathology report.
5 It's only something that you can opine to in the
6 setting of having full access to information and
7 being asked by a clinician, "What do you think
8 that this exposure was, you know, a cause,
9 because the patient's asking me."

10 And I would need to know more information,
11 and then, again, come to a conclusion based on
12 the -- the subtype of whatever malignancy
13 they're diagnosed with, whether it's a type of
14 bladder cancer, what other risk factors they
15 had.

16 So it's -- again, it's taking the weight
17 of the evidence and not looking at one
18 particular thing when coming to any sort of
19 conclusion about a cause for any malignancy.

20 BY MS. HORAN:

21 Q. I'm going to turn to your résumé, which
22 was attached to your report.

23 Dr. Michaels, since you submitted your
24 report, are there any updates to your résumé?

25 A. Well, I don't know. I don't see that it

1 says that. It's hard to see, but I don't think -- I
2 don't know. Does it say that I'm the chair of the
3 cancer committee? I don't think it has that. That's
4 a recent development in the last couple months, and I
5 don't think I updated my CV to say that.

6 Yeah, it says "member of cancer
7 committee," under my current job. It doesn't say
8 that I'm the chair of the cancer committee, which I
9 am now. So that's one thing.

10 And then if you could scroll to the
11 next -- something I just thought about.

12 Q. Sure.

13 A. It has my -- scroll one more.

14 Okay. It has my academic appointment at
15 OHSU. Oh, for medical licenses, I now have a -- I
16 reactivated my Massachusetts medical license, so I
17 need to update my CV to reflect that. But everything
18 else should be -- and then if you go to the next
19 publication.

20 Okay. So then I just recently published
21 another article that just came out this year, a
22 couple months ago, that I need to add, that had to do
23 with a -- a multicancer early detection assay that
24 showed positivity in a patient, and they ended up
25 having an unusual diagnosis, and so I published the

1 case report.

2 So I can update those and forward them
3 to Ms. Gjonaj.

4 Q. Great. Have you ever authored any
5 publications on the causes of NHL?

6 A. So in the "Fine-needle Aspiration Biopsy
7 of Secondary Neoplasms of the Thyroid Gland" that
8 was -- that we published in 2015, I would have to go
9 back and look at that, because, you know, the reason
10 that -- and I had been the first author on that
11 publication, and that was when I was in my
12 fellowship, and I had initially written that paper
13 myself. And then -- that was in 2006, and you can
14 see it was published in 2015, which is how some
15 things in academia work sometimes, unfortunately.

16 But by the time I had left, and they kind
17 of -- the -- Dr. Faquin, William Faquin, who was a
18 senior author on that, he -- he and I were the ones
19 that initially came up with the idea. And it was my
20 idea to have the words "Secondary Neoplasmas of the
21 Thyroid Gland" specifically because of lymphomas,
22 Because he wanted to call it "Metastatic Tumors to
23 the Thyroid Gland."

24 And I said, "Well, you can't" -- a
25 significant portion of the malignancies that we were

1 talking about were lymphomas, and you don't consider
2 a metastatic -- a lymphoma metastatic when it
3 involves an unusual site, depending on the history,
4 you consider either primary to the thyroid gland or
5 secondary. And you don't use the word "metastasis."

6 And some of those patients were patients
7 that had underlying autoimmune diseases. And so that
8 would have been the underlying cause; specifically, I
9 think, Sjögren's syndrome was in a couple of those
10 patients.

11 And so I don't know -- I don't -- I
12 haven't memorized that article, but we might have
13 talked about, in that setting, a cause of a
14 non-Hodgkin's B-cell lymphoma.

15 Q. Can you point me to any publications that
16 you've authored involving TCE, PCE, or benzene?

17 A. I don't think I've -- anywhere I've
18 mentioned any of those volatile organic compounds.

19 Q. And you've not authored any publications
20 on whether PCE, TCE, or benzene can cause NHL? Is
21 that fair?

22 A. That's fair.

23 Q. Have you authored any publications where
24 you've determined a threshold amount of exposure to
25 TCE, PCE, or benzene before someone's risk for

1 developing NHL increases?

2 A. No.

3 Q. Have you ever given a presentation or
4 spoken publicly about Camp Lejeune?

5 A. I don't know if I've mentioned it in the
6 setting of teaching to the pathology residents. I
7 don't specifically recall mentioning this litigation
8 at all. I've mentioned other litigations I've been
9 involved with in the setting -- in a very general
10 setting of showing them, you know, examples of cases
11 where I saw a similar case when I was an expert
12 witness for X, Y, and Z, but I don't think that I've
13 ever mentioned Camp Lejeune in that context.

14 Q. You're not an epidemiologist, correct?

15 A. So I was trained in epidemiology, in
16 addition to various other disciplines in medical
17 school, and I use epidemiology constantly, as a
18 pathologist, interpreting ongoing published research
19 in my field and similar related fields. But I am not
20 myself a Ph.D. or have any extra specific training in
21 public health with respect to epidemiology.

22 Q. And you aren't a toxicologist, fair?

23 A. So again, in chemical pathology, which is
24 a part of clinical pathology, toxicology is a
25 significant part of chemistry within -- and I don't

1 mean chemistry is like the -- the college course
2 chemistry. Chemistry deals with, you know, clinical
3 laboratory testing, you know, chemistry panel in the
4 sense of sodium, potassium, et cetera, and toxicology
5 testing. And so as the chair of the department and
6 as a board-certified clinical pathologist, I actually
7 do quite a bit of -- and have a significant knowledge
8 base in toxicology. But I'm not myself a
9 toxicologist, separately from that.

10 Q. So you use a lot of toxicology principles
11 in your practice, but you wouldn't hold yourself out
12 as an expert in toxicology; is that fair?

13 A. Well, no, I would say that as a
14 board-certified clinical pathologist, I would say
15 that I would be considered an expert in toxicology in
16 that context. But I'm not -- I would not hold myself
17 out to be a toxicologist, which some people would
18 consider to be separate from toxicology within
19 clinical pathology.

20 Q. You don't have a degree in environmental
21 health, correct?

22 A. No, I don't have a degree in environmental
23 health.

24 Q. And you don't have a degree in
25 occupational medicine; is that fair?

1 A. My -- I do not have a separate specific
2 degree in occupational medicine.

3 Q. And you're not an expert in environmental
4 risk assessments. Is that fair?

5 A. Well, again, I -- I would say, as part of
6 my job as a pathologist, as I've kind of elaborated
7 on for the last hundred minutes, I do quite a bit of
8 assessing of environmental and other biologic risk
9 factors. So I would say that that's part of my realm
10 as a pathologist, is something I use constantly in my
11 diagnostic practice.

12 Q. Have you ever conducted a human health
13 environmental risk assessment?

14 A. I have never published anything with
15 respect to environmental risk assessments.

16 Q. Setting aside "published," have you ever
17 conducted one?

18 A. I don't know that I would consider myself
19 having conducted any sort of environmental risk
20 assessment.

21 Q. And you're not offering an opinion in this
22 case on whether vinyl chloride causes non-Hodgkin's
23 lymphoma, correct?

24 A. Well, I mentioned vinyl chloride, but
25 not -- not -- just in the background of exposures,

1 but not in the sense that it was a cause -- a
2 significant cause for Mr. Vidana's diffuse large
3 B-cell lymphoma.

4 Q. We are nearing two hours, about an hour
5 and 45 minutes. Do you mind if we take just a
6 ten-minute break -- I'm at a kind of a good breaking
7 point -- and then we can come back.

8 A. That's fine.

9 VIDEOGRAPHER: We're going to go off
10 record at 10:43 a.m.

11 (A recess transpired from 10:43 a.m until
12 10:55 a.m.)

13 VIDEOGRAPHER: Back on the record
14 at 10:55 a.m.

15 BY MS. HORAN:

16 Q. Dr. Michaels, have you been to
17 Camp Lejeune?

18 A. No.

19 Q. What is your understanding of what areas
20 of Camp Lejeune were contaminated?

21 A. My understanding is it's predominantly
22 Hadnot Point and Tarawa Terrace.

23 Q. You would agree that all of the water
24 systems at Camp Lejeune were not contaminated; fair?

25 MS. GJONAJ: Object to form.

1 THE WITNESS: My understanding is that not
2 all of the ones that were tested were
3 contaminated.

4 BY MS. HORAN:

5 Q. Okay. So the best of your knowledge, not
6 all of the water systems at Camp Lejeune were
7 contaminated?

8 A. Well, again, not all of the water systems
9 that were tested were contaminated, correct.

10 Q. Is it your -- or strike that.
11 To the best of your knowledge, was Camp
12 Johnson contaminated?

13 A. Not to my knowledge. It's not known that
14 Camp Johnson was contaminated.

15 Q. And you relied on Mr. Maslia's report for
16 levels of contamination at Camp Lejeune?

17 MS. GJONAJ: Object to form.

18 THE WITNESS: Yes, the, you know, ATSDR
19 report by -- with -- you know, Maslia, and then
20 the expert report that followed.

21 BY MS. HORAN:

22 Q. And you're not offering an opinion as to
23 the accuracy of the ATSDR or Mr. Maslia's findings,
24 correct?

25 A. No, I'm relying on those levels that were

1 reported.

2 Q. Did you read Mr. Maslia's rebuttal report?

3 A. I -- off the top of my head, I don't know
4 if I did or not.

5 Q. Have you read any of the other non-Hodgkin
6 lymphoma specific causation expert reports?

7 A. It would depend -- I would recognize
8 the -- potentially the name. If it's not on my
9 "Materials Considered" list, I thought that that
10 was -- it appeared inclusive of what I had reviewed.

11 Q. Got it. Okay. So if it's not on your
12 "Materials Considered" list, then you didn't see it?

13 A. Probably that's correct, yes.

14 Q. I didn't see this, I'll represent to
15 you -- and we're happy to go back to your "Materials
16 Considered" list if it would be helpful -- but I did
17 not see the historian's report. Did you -- do you
18 recall reviewing Dr. Longley or Dr. Bringham's
19 reports? They're on the history of Camp Lejeune.

20 A. That doesn't sound familiar.

21 Q. Your "Materials Considered" list included
22 a number of general causation expert reports by the
23 Plaintiffs, and I believe you testified that you
24 reviewed those prior to submitting your expert
25 report. Am I remembering that correctly?

1 A. Right. With the exception of
2 Dr. Reynolds, I believe.

3 Q. And you performed your own general
4 causation analysis that you've included in your
5 report, correct?

6 A. That's correct.

7 Q. Why did you perform your own general
8 causation analysis instead of relying on the expert
9 reports that you reviewed?

10 A. Well, I -- I did look at the other expert
11 reports, but if I'm going to be testifying about
12 whether a particular patient's exposure was a cause
13 for their malignancy, whether it's -- you consider it
14 a substantial contributing cause or "at least as
15 likely as not" cause, that's something that I would
16 want to perform my own evaluation of the literature.
17 I would certainly take into account the opinions and
18 the research of others, but ultimately it's something
19 where I have to incorporate the weight of the
20 evidence to include, you know, exposure levels,
21 what's been established in the literature,
22 mechanistic data with respect to the chemicals we're
23 talking about, and a variety of other extenuating
24 factors. But that's something that I would want
25 to -- in order to testify under oath to my opinion, I

1 would want to have reviewed that and provided a
2 general causation analysis myself.

3 Q. Are you relying on the Plaintiffs' general
4 causation experts in your opinion?

5 A. Other than, you know, the data that, you
6 know, Dr. Reynolds has that I -- was published after
7 my report -- or not "published," but I guess issued
8 after my report -- I wouldn't say that I'm relying on
9 any of their reports. I certainly evaluate them and
10 agree with the vast majority, you know, that has been
11 stated in their reports, but I wouldn't say that I'm
12 relying on them, like I would rely on a peer-reviewed
13 published study or, you know, data that's been, you
14 know, gathered and published in the literature.

15 Q. Why -- strike that.

16 Have you reviewed any of the United States
17 general causation expert reports?

18 A. Were those not the ones that we talked
19 about earlier, that are on my "Materials Considered"
20 list?

21 Q. I'm going to pull up your "Materials
22 Considered" list again. So, bringing back up
23 Exhibit 2.

24 Dr. Michaels, do you see it on your
25 screen?

1 A. Yes.

2 Q. So there's -- general causation expert
3 reports are on -- it looks like they're listed as
4 Numbers 7 through 11. Do you see those?

5 A. Yeah.

6 Q. Okay. And is it your understanding that
7 these are Plaintiffs' general causation expert
8 reports? Or are they United States?

9 A. Well, could you scroll to the other pages?
10 Because I thought the other pages had -- so aren't
11 those 1 through 4, under "Expert Materials"? Are
12 those not --

13 Q. So those are the --

14 A. Sorry.

15 Q. Sorry. Let me -- let me ask the question.

16 So is it your understanding that on the
17 last page of Exhibit 2, Expert Materials 1 through 4
18 are the general causation expert reports by the
19 United States? Or specific causation expert reports?

20 A. I -- I didn't know --

21 MS. GJONAJ: Object to form.

22 THE WITNESS: I -- I just thought you
23 meant -- sorry. I thought you meant only
24 Plaintiffs' reports.

25 I don't think that those were -- I don't

1 know if they included any general opinions. I
2 don't remember if they've included any general
3 opinions. But for the most part, I think those
4 were addressing Mr. Vidana's case.

5 But I don't know if, like mine, they also
6 included -- as you had already, you know,
7 alluded to -- my own general causation aspect,
8 because I thought that they did.

9 BY MS. HORAN:

10 Q. Have you -- does the name "Dr. Goodman"
11 ring a bell?

12 A. It rings a bell.

13 Q. Have you reviewed the reports by
14 Dr. Goodman in this case?

15 And I'm happy to scroll through. I
16 didn't -- I'm not trying to trick you. I'm happy to
17 scroll through. I don't -- I don't recall seeing
18 them on your list, but --

19 A. Yeah, I don't either. I -- the name
20 sounds familiar in this context, but I don't
21 specifically remember, as I sit here, that I reviewed
22 her, right? It's -- isn't it --

23 Q. It is, yeah. And I guess, for -- I
24 believe you cite to one of her studies in your -- in
25 the substance of your report.

1 A. Oh, okay.

2 Q. But I'm just wondering if you also saw her
3 expert report in the case.

4 A. I don't recall.

5 Q. Okay. You did not conduct -- let me take
6 down Exhibit 2.

7 You did not conduct a Bradford Hill
8 analysis; fair?

9 A. Well, I thought I alluded to Bradford Hill
10 analysis, but I -- in my report. But I didn't like
11 list them completely separately and specifically, and
12 go through each of the nine or -- factors in Bradford
13 Hill. But that's something that kind of -- do
14 evaluate in this context with respect to causation.

15 Q. Do you agree with the principle that the
16 dose makes the poison?

17 MS. GJONAJ: Object to form.

18 THE WITNESS: Well, again, that's
19 something that I also alluded to in my report.
20 But that's very dependent on the poison and the
21 mechanism of the poison.

22 And so for something like a -- that has
23 sole promoter effects, as far as its role in
24 carcinogenesis, then typically yes, the dose
25 makes the poison. But if you're talking about

1 genotoxic initiator effects, then -- although
2 dose does come into play, it's not necessarily a
3 requirement. It depends on a whole host of
4 other factors, specifically with the mechanism
5 of how it initiates tumors and its specific
6 genotoxicity.

7 BY MS. HORAN:

8 Q. Does the dose make -- or -- strike that.
9 Would you agree that the risk for
10 developing a disease from a chemical exposure
11 increases with dose?

12 A. I would say, as a general principle,
13 that's generally accurate.

14 Q. What level of exposure to TCE is necessary
15 to cause NHL?

16 MS. GJONAJ: Object to form.

17 THE WITNESS: Well, as I kind of alluded
18 to earlier, that there -- you know, it's -- it's
19 very difficult, with a known carcinogen, to come
20 up with any sort of known dose or known
21 threshold cause of a particular disease; that
22 what you need to rely on is observational
23 studies, mechanistic data, take the weight of
24 the evidence, and, you know, what we know from
25 some of the observational studies are amounts

1 that -- those amounts have been associated with
2 an increased risk of a particular type of
3 malignancy in the case -- in this case,
4 non-Hodgkin's B-cell lymphoma.

5 So it really depends on the data that's
6 been able to be done, because as I alluded to
7 earlier, and talked about, you can't really do a
8 randomized controlled trial with a known
9 carcinogen, because that would be impractical
10 and unethical to -- to do such a thing, where
11 you would expose individuals to varying known
12 carcinogen levels, and follow them for years, to
13 determine disease prevalence or incidence, or
14 mortality related to it.

15 So, you know, it would really depend on
16 the data that you're evaluating and the way its
17 study was done to -- to come up with any sort of
18 interpretation as far as, you know, what dose is
19 associated with a malignancy.

20 But even with that, you know, that could
21 vary significantly, based on how the study was
22 done and -- and the type of confounding
23 variables that are seen in the study, the
24 nondifferential bias, et cetera.

25

1 BY MS. HORAN:

2 Q. Do you agree that the body has mechanisms
3 to repair DNA damage at low levels of exposure to
4 genotoxic substances?

5 MS. GJONAJ: Object to form.

6 THE WITNESS: Well, that's the way that
7 the body is supposed to work. But some of those
8 mechanisms are also targeted by those same
9 carcinogens. So that is the general rule of the
10 immune system and your DNA repair mechanism; but
11 if you're being exposed to a substance that also
12 targets the immune system, or targets those DNA
13 repair mechanisms, then it would be -- it's
14 difficult. And that's why those -- some
15 carcinogens or some chemicals are listed as
16 carcinogens because they target those repair
17 mechanisms.

18 BY MS. HORAN:

19 Q. For the DNA repair mechanisms to be
20 targeted, the body has to be overwhelmed by a high
21 level of exposure; fair?

22 A. No. That's not accurate at all.

23 Q. And why not?

24 A. Because it's not accurate. Because it
25 doesn't have to be a high level of exposure. It

1 depends on a particular person's immune system,
2 whether they have any sort of inherent
3 immunodeficiency or an acquired one, based on that
4 particular exposure.

5 That's exactly why patients that have
6 immune deficiencies, like patients that have AIDS
7 because of an HIV infection cannot mount an immune
8 response to malignancy. And when you treat their
9 underlying immunodeficiency, the malignancy goes
10 away.

11 And so it doesn't have to be a high level
12 at all. It would be very dependent what you're
13 talking about, what specific exposure you're talking
14 about, and what malignancy you're talking about.

15 Q. A bit earlier you were talking about how
16 studies look at the amounts exposed to a
17 particular -- particular contaminant -- we'll say
18 TCE -- might show an increased risk. Do you recall
19 kind of talking about that, just a -- a few moments
20 ago?

21 A. Yes.

22 Q. Okay. What level of a TCE amount or dose
23 is associated with an increased risk in developing
24 diffuse large B-cell lymphoma?

25 A. So there are studies that -- where I've

1 seen it evaluated as -- I've seen 5 parts per billion
2 for TCE. I've also seen it where they didn't specify
3 a dose, but it was as low as 30 days, or one quarter,
4 which -- one quarter would be, you know,
5 three months. But that was the lowest time period
6 from that particular study; I think it was Bove,
7 actually.

8 And we don't know of anything lower than
9 that. It's very possible something lower than that
10 could have also caused the same disease, in this case
11 diffuse large B-cell lymphoma.

12 So I would say, from where there has
13 been a delineation of exposure amounts, I would say
14 5 parts per billion.

15 Q. And so your risk of developing
16 non-Hodgkin's lymphoma is increased after your
17 exposure to 5 parts per billion of TCE? That's -- am
18 I understanding you correctly?

19 A. Right. With a -- a minimum duration
20 that's been kind of established as at least 30 days,
21 a 30-day exposure period.

22 Q. And -- okay. So putting that together,
23 your -- you have an increased risk of developing --
24 strike that.

25 You have an increased risk of developing

1 diffuse large B-cell lymphoma if you're exposed to
2 5 parts per billion of TCE over 30 days? Is that
3 your opinion?

4 A. Well, and that would also depend on what
5 other exposures you're having at the same time.
6 Because, you know, we know that these volatile
7 organic compounds act at least, you know, additively,
8 if not synergistically. So, you know, so looking at
9 one particular chemical alone is not really the
10 situation that we're dealing with with the
11 Camp Lejeune water contamination.

12 So it's hard to piece out each individual
13 one. But as far -- as best as we can tell, again,
14 without not having randomized controlled trials, in
15 that just looking at TCE alone, that would be kind of
16 what the data seems to suggest, based on the
17 observational studies, again, in combination with the
18 mechanistic data.

19 Q. And what observation studies are you
20 referring to for the opinion that your risk increases
21 at exposure to 5 parts per billion over 30 days?

22 A. So I think that was in -- well, that's in
23 combination with the ATSDR, where they talked about
24 30 days. And I think another article . . .

25 Q. Would it be helpful if I pulled up your

1 report, and you could tell me what studies you're
2 referencing?

3 A. Sure.

4 MS. GJONAJ: You can open the chat if you
5 need to scroll through it yourself,
6 Dr. Michaels.

7 MS. HORAN: Sure. Yeah, it's still in
8 there. And I -- I put it on the screen as well.

9 BY MS. HORAN:

10 Q. I'm on Exhibit 1, and I've scrolled to
11 page 7, which is your section that begins on TCE.
12 But of course I'm happy to go wherever you'd like.

13 A. Okay.

14 I know I specifically mentioned the 30-day
15 timeline in my report. Just trying to think of --

16 Q. So in the middle of page 7, that big
17 paragraph in the middle says, "This is" --

18 A. Oh, yeah.

19 Q. "This is consistent with the establishment
20 of a minimum duration at Camp Lejeune of 30 days in
21 order to be eligible for the health benefits under
22 the Camp Lejeune Act. This is specifically addressed
23 in the ATSDR 2017" -- then the name of the report --
24 "where it is noted that 'the results from the
25 Camp Lejeune mortality studies suggest that a 30-day

1 minimum duration requirement may be appropriate since
2 elevated risks for some of the diseases evaluated
3 were observed for exposure durations of 1-3 months.'"

4 Is that what you're referring to?

5 A. Yes.

6 Q. Okay. Is it your understanding that
7 those 30 days are based on science?

8 A. Yes.

9 Q. And what science are you relying on to say
10 that?

11 A. Well, again, I would -- if you -- I think
12 if you pull up the ATSDR, that document that I'm
13 talking about, they go into details about why they
14 support that -- they specifically say that the data
15 supports that use of that timeline.

16 Q. Dr. Michaels, do you see on your screen
17 the ATSDR report that we were just referring to?

18 MS. GJONAJ: Counsel, if you can please
19 drop that in chat for him as well, please.

20 MS. HORAN: Sorry.

21 I'll mark this as Exhibit 3.

22 (Exhibit 3 was marked for identification.)

23 MS. HORAN: And this is the ATSDR
24 Assessment of the Evidence, dated January 13th,
25 2017.

1 BY MS. HORAN:

2 Q. Turning to page 11, you see it says
3 "Assumptions on Duration of Exposure"?

4 A. Yes.

5 Q. It begins, "One objective of this report
6 was to evaluate whether there was sufficient
7 information in the scientific literature to determine
8 a minimum duration at Camp Lejeune, or a minimum
9 level of exposure, necessary to increase the risk of
10 one or more of the diseases being assessed."

11 Did I read that correctly?

12 A. Yes.

13 Q. And then that answer is at the bottom,
14 which is the last sentence on page 11, reads: "Given
15 that sufficient evidence for a threshold is lacking,
16 ATSDR recognizes that a decision to establish a
17 specific minimum exposure duration for policy
18 purposes will primarily be based on social, economic,
19 and legal factors."

20 Did I read that correctly?

21 A. Yes.

22 Q. Do you agree with ATSDR's assessment that
23 sufficient evidence is lacking to determine a
24 specific minimum exposure?

25 A. Well, specifically in the setting of

1 assigning -- as I mentioned, assigning a specific
2 minimum exposure, because I think what the CDC and
3 the ATSDR are acknowledging is that you can't really
4 do that. You need to take in multiple aspects of
5 medical literature and the science in order to come
6 to a conclusion that only this 30-day minimum is
7 based on social, economic, and legal factors.

8 Because scientifically speaking, it's not
9 really something you're able to do, like you can do
10 with medications that are coming to the market where
11 there have been randomized controlled trials, that --
12 so yes, I agree with that, in the context of -- it's
13 not something that can really be done in the setting
14 of a known carcinogen.

15 Q. So a specific minimum exposure duration
16 cannot be set by specific -- or strike that.

17 A specific minimum exposure cannot be set
18 by scientific principles; fair?

19 MS. GJONAJ: Object to form.

20 THE WITNESS: No. That's not accurate.

21 So you're -- you're talking in two separate
22 things. So you're trying to make a generalized
23 statement based on a statement that's made in
24 the context of TCE, benzene, and PCE.

25 So in some cases, depending on the

1 exposure and depending on the substance that
2 you're looking at, you can do that. You
3 absolutely can do that. And we do do that for
4 certain things. And it has been done in the
5 past for different medications, et cetera.

6 But with the -- in the setting of a known
7 carcinogen that's already known, where a
8 disease -- you're looking at a disease that's
9 already happened, you know, you can't -- the
10 maximum contaminant level doesn't really apply.

11 It's basically meant as a public health
12 risk assessment for people without disease.
13 Here we're talking about people that have
14 already developed the disease. So when
15 evaluating those individuals, that are a
16 specific subgroup of people that have been
17 exposed and actually developed the disease, it's
18 being able to go back and look at -- did they
19 have an exposure level, in the setting of this
20 particular context, or litigation, that would
21 have been sufficient in establishing sufficient,
22 in this context, which is what they say and what
23 I agree to, is 30 days, based on all of the
24 factors that have been looked at in not only the
25 epidemiological studies that they evaluate in

1 their report, but, you know, as I've alluded to
2 and -- and have addressed and talked about, the
3 mechanistic data that you take into account when
4 evaluating the weight of the evidence.

5 BY MS. HORAN:

6 Q. Going back to the first full paragraph,
7 the second sentence reads: "The 2012 Honoring
8 America's Veterans and Caring for Camp Lejeune
9 Families Act established a minimum duration at
10 Camp Lejeune of 30 days in order to be eligible for
11 health benefits under the Act." Do you see that?

12 A. Yes.

13 Q. The next sentence reads: "It is unclear
14 how the minimum duration was established for this
15 legislation." Do you agree?

16 A. Well, I don't know how they established
17 it, but I agree with -- that that's -- that you read
18 it correctly, and that they go on to say that they
19 can't disagree with it based on the epidemiologic
20 studies that they addressed in this report.

21 Q. Okay. The next sentence says, "However,
22 the evidence from the epidemiological studies
23 included in this assessment is not sufficient to
24 contradict this minimum duration."

25 I believe you just testified you agree to

1 that statement?

2 A. Yes.

3 Q. It says, "Moreover the results from the
4 Camp Lejeune morality studies suggest that a 30-day
5 minimum duration requirement may be appropriate since
6 elevated risks for some of the diseases evaluated
7 were observed for exposure durations of one to
8 three months." Did I read that correctly?

9 A. Yes.

10 Q. Which -- or have you reviewed any of the
11 Camp Lejeune morality studies?

12 A. "Morality"? You mean "mortality." Did
13 you say --

14 Q. Correct. No, you're right. "Mortality."
15 Thank you for that.

16 A. Yeah, yeah. Yes.

17 Q. Okay. Which mortality studies have you
18 reviewed?

19 A. I believe their first author was Bove.

20 Q. And have you reviewed the mortality study
21 that's on your -- cited in your report or on your
22 "Materials Considered" list?

23 A. Yes.

24 Q. Do you know if NHL is one of the diseases
25 where there may be an elevated risk at one to

1 three months' duration exposure?

2 A. Yes. That's my understanding.

3 Q. And that's your understanding based on
4 what?

5 A. On the -- what their data was.

6 Q. In the mortality studies? Or are you --
7 who is "they"?

8 A. I have to -- I'm going to have to --

9 MS. GJONAJ: I'm going to object.

10 THE WITNESS: -- agree with you that --

11 MS. GJONAJ: If you're going to ask him
12 about specific studies, I ask that you let him
13 look at those studies.

14 THE WITNESS: That's what I was just going
15 to say, is that I'd want to look -- there are a
16 lot of studies that I reviewed. I would want to
17 relook at them before I answer.

18 BY MS. HORAN:

19 Q. Sure. I'm just trying understand what --
20 you know, what your understanding is off the top of
21 your head. And you know, we can -- I'm certainly not
22 asking you about the details of any study. I'm happy
23 to pull up any that you reference. I'm just trying
24 to understand, sitting here today, kind of what your
25 basis is.

1 And again, happy to pull up your report,
2 if that would be helpful, or any other --

3 A. I think I'd rather -- yeah. So you asking
4 me about the relative risk of a study is asking me to
5 detail a study. So I would argue that, you know, in
6 order to answer accurately and give my -- the correct
7 opinion, I'd want to just rereview, because there are
8 a lot of different studies that I reviewed.

9 Q. Okay.

10 Turning back to Exhibit 3, which is ATSDR,
11 the last sentence says, "These results should not be
12 surprising given that the levels of TCE, PCE and
13 vinyl chloride measured or estimated in the drinking
14 water systems at Camp Lejeune considerably exceeded
15 their respective MCLs." Did I read that correctly?

16 MS. GJONAJ: What page are you reading
17 from?

18 BY MS. HORAN:

19 Q. It's the same paragraph. It's the last
20 sentence of the first paragraph.

21 A. Oh, of the first paragraph. I thought you
22 said the last paragraph on the -- or the last
23 sentence on the page. Yeah.

24 Could you say that again?

25 Q. Sure. "These results should not be

1 surprising given that the levels of TCE, PCE and
2 vinyl chloride measured or estimated in the drinking
3 water systems at Camp Lejeune considerably exceeded
4 their respective MCLs." Did I read that correctly?

5 A. Yes.

6 Q. You agree that the ATSDR did not include
7 benzene in that sentence?

8 A. Yes.

9 Q. The next sentence reads: "The studies
10 evaluated in this report provide very limited
11 information concerning the level or duration of
12 exposure associated with an increased risk of a
13 cancer or other disease." Do you see that sentence?

14 A. Yes.

15 Q. Do you agree?

16 A. With that sentence?

17 MS. GJONAJ: Object to form.

18 THE WITNESS: So I would say, looking at
19 the studies, the epidemiologic studies alone,
20 that yes, that is -- I would agree with that
21 sentence.

22 But, you know, I think what you do as a
23 general causation, to evaluate a level or
24 duration of exposure, is you have to take into
25 account how that exposure in the body causes

1 mechanistic effects that would lead to
2 carcinogenesis.

3 So I would agree with that sentence with
4 respect to the studies that were evaluated in
5 that report. But when going into -- looking at
6 the overall, you know, entirety of the data, I
7 would say you have to take into account multiple
8 things when trying to talk about an increased
9 risk of cancer, more so than just level or
10 duration of exposure.

11 BY MS. HORAN:

12 Q. Turning back to your testimony that
13 exposure to TCE at 5 parts per billion over 30 days
14 would increase your risk of developing non-Hodgkin's
15 lymphoma, I believe you testified that that was based
16 on the ATSDR report we just looked at, which is
17 Exhibit 3.

18 MS. GJONAJ: Object to form -- sorry.

19 I'll let you finish your question.

20 BY MS. HORAN:

21 Q. What else did you rely on for that
22 assessment?

23 A. The Cohn study, C-o-h-n.

24 Q. Anything else? And again, I'm happy to
25 pull up your report, if that would be helpful for

1 you.

2 A. So again -- and that's in combination
3 with, you know, the plethora of data as kind of
4 evaluated by IARC with respect to carcinogenicity of
5 trichloroethylene. So, you know, just taking those
6 numbers by themselves, you know, you don't
7 necessarily have biological plausibility, just based
8 on the specificity or the, you know, actual
9 epidemiologic data.

10 So when coming to my conclusions, again,
11 and I'm -- I don't mean to sound like a broken
12 record, and I don't mean to keep repeating myself;
13 but I mean, I just want to make sure that my
14 testimony is clear that it's not just one thing I'm
15 coming to, or just a couple studies that have talked
16 about duration, or studies that have talked about,
17 you know, levels of exposure that form my opinion
18 that -- that can be a -- you know, cause, or in this
19 case, at least as likely as not a cause of whatever
20 malignancy -- in this case diffuse large B-cell
21 lymphoma -- again, I'm -- I'm incorporating a lot of
22 other studies that talk about carcinogenicity and,
23 you know, immunomodulation, immunodeficiency, you
24 know, free radical damage to, you know, lymphocytes,
25 TNF alpha, interleukin 6 production by these free

1 radicals.

2 I mean, there's a lot of different things
3 I'm taking into account, and not just the data that
4 has specifically addressed time and duration and
5 level. If that makes sense.

6 Q. In thinking through your general causation
7 analysis, were you using "at least as likely as not"
8 as your standard for determining causation of the
9 different chemicals? Or what standard were you
10 using? Are you using, I should say.

11 A. Yes. That is the standard that I
12 addressed in my report that I'm using in this case.

13 Q. And where did that standard come from?

14 A. So when I was told about that standard,
15 that that was the standard being used in this case, I
16 did my own kind of independent research into that
17 standard, because from my recollection, I know
18 different courts have different standards for
19 certainty as far as an expert witness testimony goes.
20 And most of what I've been asked to do in the past
21 has been to look at a case with the "more likely than
22 not" as a standard, was a cause, et cetera.

23 But I wasn't asked to do that in this
24 case, so I did not evaluate the literature in that
25 context. So before I kind of got involved, I read

1 more about "at least as likely as not" and how that
2 was the standard being issued, I guess, with
3 Camp Lejeune and kind of the history behind that,
4 and -- I think that that -- that's where I also, in
5 addition to the article I cited about Goodman, came
6 across, in looking into that, I believe, terminology
7 that she used, similarly, if not the same, in some of
8 her literature or data.

9 And the other word I heard, you know, used
10 synonymously, or that I read used synonymously was
11 "equipoise." So that was kind of what I did, when I
12 first heard that phrase, as far as the -- the legal
13 standard being used in this case.

14 Q. What level of exposure or amount is
15 associated with an increased risk in developing NHL
16 and PCE?

17 MS. GJONAJ: Object to form.

18 THE WITNESS: Could you say that again?

19 BY MS. HORAN:

20 Q. Sure. What amount of PCE is associated
21 with an increased risk in developing diffuse large
22 B-cell lymphoma?

23 MS. GJONAJ: Same objection.

24 THE WITNESS: Well, I would say with PCE,
25 I don't think the data is as strong, because

1 it's not considered a known human carcinogen;
2 it's a probable human carcinogen. And that's
3 reflective of the fact that being able to
4 separate that out has not been as easy as it for
5 TCE or benzene or other volatile organic
6 compounds.

7 And so -- but again, that same Cohn
8 analysis -- from 1994, I believe -- also had
9 elevated ratios associated with that same
10 5 parts per billion. And -- but again, with all
11 of these, I am addressing your question with
12 respect to the levels that have been associated
13 with; but what we're dealing with here is a case
14 where these individuals, including Mr. Vidana,
15 have been exposed to several volatile organic
16 compounds that were in the water.

17 And so in this case -- I mean, it's fine
18 to ask, you know, an individual question about a
19 particular, you know, carcinogen, or known
20 possible carcinogen -- in the case of PCE, a
21 probable carcinogen, I should say, in the case
22 of PCE -- for human carcinogen, I should say.

23 But I'm looking at this case with respect
24 to the weight of all of the volatile organic
25 compounds and the fact that, as I testified

1 earlier, are at least additive if not likely
2 synergistic in their effects with respect to
3 carcinogenesis, including with diffuse large
4 B-cell lymphoma.

5 BY MS. HORAN:

6 Q. Sure. And Dr. Michaels, your report
7 goes -- has a subsection for TCE; it has a subsection
8 where you look at PCE; and it has a subsection where
9 you look at benzene. And you review epidemiological
10 studies to determine associated increased risk with
11 developing NHL or, in some instances, they are
12 specific to diffuse large B-cell lymphoma. Am I
13 reading your report correctly?

14 A. Yes.

15 Q. And I'm just trying to -- to kind of
16 follow -- you've done the analysis per -- per
17 chemical. And I understand your -- your ultimate
18 conclusion is about an individual at Camp Lejeune.
19 But I'm just -- I'm trying to understand the way
20 you've done your analysis, which is to look at each
21 individual constituent. Is that fair?

22 A. Yes.

23 Q. Okay. So you mentioned for PCE, the --
24 the Cohn study establishes about 5 parts per billion.
25 Are there any other studies that you can think of

1 that supports an increased risk of exposure to
2 5 parts per billion of PCE?

3 MS. GJONAJ: Object to form.

4 BY MS. HORAN:

5 Q. And I'm happy to show you your report
6 again.

7 A. Yeah. Again, not that I can recall off
8 the top of my head.

9 Q. Okay. Would it be helpful for you to look
10 at your report?

11 A. Yeah, it could. I could look at it.

12 Q. Let me pull it up.

13 So I'm putting back on this screen. This
14 is Exhibit 1. And I'll turn to your section on PCE,
15 which starts on page 9. And I can read you the
16 question, if it would be helpful; or if you could
17 just let me know which studies support the 5 parts
18 per billion exposure with an increased risk.

19 MS. GJONAJ: Counsel, could you repeat
20 what the pending question was? Sorry.

21 BY MS. HORAN:

22 Q. Sure. What studies support a 5 parts per
23 billion exposure to PCE is associated with an
24 increased risk in developing non-Hodgkin's lymphoma
25 or diffuse large B-cell lymphoma?

1 MS. GJONAJ: Objection. Form.

2 THE WITNESS: You know, again, I don't see
3 anything that specifically talks about the
4 5 parts per billion. But again, my analysis, as
5 I've mentioned before, the -- I think it's --
6 it's difficult to -- if not impossible, in this
7 setting -- to come up with any sort of known
8 threshold for any of these, because you go based
9 on, you know, various aspects of the biology,
10 the biologic plausibility and what few
11 epidemiologic studies have, and most of them
12 cannot -- are not able to quantify it to that
13 degree. It's often -- more often duration than
14 actual amount or level.

15 BY MS. HORAN:

16 Q. And what duration of exposure to PCE is
17 associated with an increased risk in the development
18 of non-Hodgkin's lymphoma or diffuse large B-cell
19 lymphoma?

20 MS. GJONAJ: Object to form.

21 THE WITNESS: Well, again, I would say
22 30 days would be -- is generally accepted, based
23 on these studies.

24 BY MS. HORAN:

25 Q. When you say "these studies," what studies

1 are you referring to?

2 A. Well, again, like -- kind of going back to
3 the ATSDR. You know, they have addressed this. And
4 agree -- and I'm not disagreeing with the ATSDR that
5 based on their analysis and my also understanding and
6 relying on their report, that 30 days is, in the
7 context of the carcinogens we're talking about here,
8 knowing the underlying mechanistic causation of
9 the -- the carcinogen -- carcinogenesis that's caused
10 by these, that it's an appropriate number to use,
11 given the limitations of being able to come up with
12 an appropriate number.

13 Q. Anything beyond --

14 A. So -- say that again?

15 Q. Oh, I didn't mean to cut you off. I
16 didn't know if you were done.

17 But I was going to ask, anything other
18 than the 2017 ATSDR assessment of the evidence that
19 we've looked at?

20 A. Again, by definition, it's the assessment
21 of the evidence. So the CDC is doing an assessment
22 of the evidence. So when you ask me if I agree with
23 such-and-such organization or such-and-such
24 documentation, in this example I'm agreeing with
25 their assessment of the evidence, that their

1 researchers did, that I had -- in the few reports
2 that have specifically identified -- have been able
3 to identify those timelines, seem to support that
4 evaluation and that assessment.

5 Q. I'm turning on Exhibit 1 to page 10, which
6 is where your section on benzene begins.

7 And what level of exposure to benzene is
8 associated with an increased risk in the development
9 of diffuse large B-cell lymphoma?

10 If you have --

11 A. Well -- sorry. Go ahead.

12 Q. I'm saying, if you have an opinion on
13 that. I don't know if you do.

14 A. Well, there's a -- one of the studies that
15 I talked about -- I think it was the Swedish study --

16 Q. Would you like me to turn to the next
17 page?

18 A. Yeah, I think by Nilsson, where they
19 looked at workers with at least one month of an
20 exposure history. That was one case where they
21 looked at the timeline of exposure. But that's the
22 limitation of, you know, these studies. And it could
23 have been earlier than a month. But that's, you
24 know, the earliest time period.

25 So it's really dependent on how these

1 epidemiological studies are organized and their own
2 particular methods. But that -- they have, you know,
3 one month as being a minimum exposure, that those
4 seamen exposed to cargo vapors from -- from gasoline
5 and other petroleum products that contain benzene had
6 a significantly increased risk of non-Hodgkin's
7 lymphoma.

8 Q. And do you have -- so you discussed
9 amount -- or strike that.

10 You've discussed duration, and you cited
11 to this Nilsson study, which is footnote 46 on your
12 report. Do you have any opinion on the amount, the
13 level of benzene one would need to be exposed to that
14 would be associated with an increased risk in
15 developing diffuse large B-cell lymphoma?

16 MS. GJONAJ: Object to form.

17 THE WITNESS: Well, again, it's -- it's --
18 I mean, there's not -- I mean, other than -- you
19 know, and I'm not -- as I've already mentioned,
20 I'm not relying on the maximum contaminant
21 level, which I believe is established as 5 parts
22 per billion or 5 micrograms per liter, but --
23 because that has a separate -- very separate
24 connotation for public health risk assessment.

25 But there was nothing in the literature

1 that I saw to disagree with -- with that level.
2 And again, the duration of 30 days, in
3 combination with all the other mechanistic data,
4 is being associated in patient -- in these
5 particular individuals with an increased risk of
6 non-Hodgkin's lymphoma.

7 MS. GJONAJ: Counsel, just -- whenever
8 it's a good time, if I could -- we could take a
9 short break for the restroom, whenever --

10 MS. HORAN: Let's go right now. That's
11 fine. Let's go right now.

12 THE WITNESS: We're going off the record
13 at 11:46 a.m.

14 (A recess transpired from 11:46 a.m. until
15 11:57 a.m.)

16 VIDEOGRAPHER: Back on the record at
17 11:57 a.m.

18 BY MS. HORAN:

19 Q. Dr. Michaels, I'm going to pull back up
20 your expert report, which is on page -- I put on the
21 screen page 7. Do you see that?

22 A. Yes.

23 Q. Okay. The main paragraph in the middle,
24 the full paragraph in the middle of the page, the
25 last sentence reads: "The current U.S. MCLs for TCE,

1 PCE, and benzene are 5 parts per billion, but only
2 2 parts per billion for vinyl chloride. The
3 concentrations present in the water during
4 Mr. Vidana's time there were well in excess of the
5 MCLs." Did I read that correctly?

6 A. Yes.

7 Q. What is an MCL?

8 A. It's a maximum contaminant level.

9 Q. And do you know how an MCL is determined?

10 A. I don't know the baseline for how it's
11 determined, like the underlying science or data that
12 goes into determining it, other than evaluation of
13 whatever studies are available at the time. But as
14 I've alluded to, and specifically testified to, it's
15 not something that is used in the context of
16 causation assessment, only because an MCL's meant to
17 be a -- basically a public health risk assessment for
18 people that do not have evidence of the disease,
19 which doesn't apply to someone that's already been
20 diagnosed with a malignancy associated with whatever
21 MCL carcinogen or chemical we're talking about.

22 Q. Why include MCLs in your report, then?

23 A. As a background for the levels that have
24 been established for what's considered increased
25 risk. But, you know, only as a background to, you

1 know, what the levels we're talking about, the
2 chemicals that we're talking about are.

3 Q. Do you know what time period is used in
4 order to assess an MCL?

5 MS. GJONAJ: Object to form.

6 THE WITNESS: I don't know what you mean
7 by "time period."

8 BY MS. HORAN:

9 Q. Do you know how long one would have to be
10 exposed to the amount of an MCL in order for there to
11 be an increased risk? Do you know what time period
12 they considered?

13 MS. GJONAJ: Object to form.

14 THE WITNESS: I don't know what's -- if
15 that's uniform for each substance that you're
16 talking about, or if that's something that
17 varies depending on the substance.

18 BY MS. HORAN:

19 Q. Sure. So you're just not sure?

20 A. In that context, I think it would depend
21 on what you're talking about.

22 Q. Do you know what time period one would
23 have to be exposed to TCE at 5 parts per billion in
24 order to have an increased risk such that they
25 determine to set the MCL at 5 parts per billion?

1 A. Well, again, that's -- that's not the
2 scope of what I evaluated in this context. Because
3 as I just testified to, I'm not really using MCL to
4 assign causation. I'm using Mr. Vidana's exposure to
5 multiple volatile organic compounds, the fact that
6 those have substantial mechanistic data that causes
7 initiation of carcinogens through a variety of
8 mechanisms, in addition to promotion of malignancies
9 including non-Hodgkin's lymphoma, through a variety
10 of mechanisms.

11 So it's not something that I focused on
12 for the purposes of -- of this report, or plays any
13 part into me forming my opinions in this specific
14 case.

15 Q. Sure. And so you don't know.

16 A. I -- I just answered the question.

17 Q. Okay.

18 A. That it's not something that I -- I
19 haven't memorized every single aspect of -- of
20 toxicology or environmental science. It's -- it's
21 not something that was necessary to come to my
22 opinions and conclusions in this case.

23 Q. You state -- the second sentence that I
24 read was "The concentrations present in the water
25 during Mr. Vidana's time there were well in excess of

1 the MCLs."

2 Why did you compare the concentrations
3 present during Mr. Vidana's time there to --

4 (Noise disruption.)

5 A. It was just a factual sentence. It wasn't
6 meant to -- it was just simply meant as a reference
7 point, but not that it meant anything more than that
8 in the setting of causation in this case.

9 Q. Okay. So you're not relying on the MCLs
10 for any type of determination of Mr. Vidana's
11 causation? The causation of Mr. Vidana's NHL, I
12 should say.

13 A. That's correct. I'm relying on a
14 combination of the weight of the evidence that I've
15 gone over, including the amount of the chemicals that
16 were in the water while he was there, the number of
17 days that he was on base, the number of exposure
18 events he would have had, the mechanistic data with
19 respect to all of the initiation and promoting
20 properties of these particular chemicals. I'm
21 relying on everything to form my opinions.

22 Q. The 2017 assessment of the evidence that
23 you've cited on page 7 of your report, have you read
24 all of the studies cited to in that assessment?

25 A. Could you say that again?

1 Q. Sure. On page 7 of your report, which is
2 on the screen, you cite to the 2017 assessment of the
3 evidence. It's also been marked as Exhibit 3. Do
4 you know the document I'm talking about?

5 A. Yes.

6 Q. Okay. Have you read the studies that are
7 cited in that assessment?

8 MS. GJONAJ: Object to form.

9 THE WITNESS: Some of them. Not all of
10 them, because not all of them deal with
11 non-Hodgkin's lymphoma.

12 BY MS. HORAN:

13 Q. Have you read the studies related to
14 non-Hodgkin's lymphoma that are cited in the 2017
15 assessment of the evidence?

16 A. I would -- my -- my opinion is that I've
17 read most of them that I've gone through. So -- but
18 there were several -- many that had nothing to do
19 with non-Hodgkin's lymphoma that I could see.

20 But most of them, I did.

21 Q. And the ones you reviewed would be on
22 your -- either directly cited to in your report or on
23 your "Materials Considered" list?

24 A. That's correct.

25 Q. People with no exposure to TCE, PCE, or

1 benzene can still develop diffuse large B-cell
2 lymphoma, correct?

3 A. Yes. As I spent quite a bit of time
4 talking about earlier, there are a variety of causal
5 risk factors for diffuse large B-cell lymphoma
6 that -- diffuse large B-cell lymphoma is not a
7 malignancy that is specific to TCE, PCE, or benzene
8 exposure.

9 Q. You've mentioned the potential synergistic
10 or additive affects of PCE, TCE, and benzene a couple
11 of times today. What analysis did you do to come to
12 your determination that the chemicals are potentially
13 synergistic?

14 A. Well, that's based on my overall general
15 review of the literature and known carcinogenicity
16 with respect to volatile organic compounds, that
17 that's something that is generally accepted in the
18 medical community with respect to compounds that have
19 initiation capabilities in the sense of
20 carcinogenesis with respect to radical oxygen species
21 formation, secretion of tumor necrosis factor alpha
22 and interleukin 6, immunosuppressive effects. That's
23 something that is not disputed in the medical
24 literature.

25 So that's -- and there are -- a lot of

1 those are done based on in vitro studies and in vivo
2 studies, looking at the individual effects on
3 particular mutation analysis, numbers of mutations,
4 amounts of free radicals, et cetera, comparing, you
5 know, one cell type versus another with sole
6 exposure, sole exposure, and then looking at combined
7 exposure.

8 So that's something that is, I think,
9 well-published and known in the literature.

10 Q. Do you agree that the exact relationship
11 between the interactions of TCE, PCE, benzene, and
12 vinyl chloride is not known?

13 A. Yeah, I would --

14 MS. GJONAJ: Object to form.

15 THE WITNESS: I would say that, you know,
16 it's -- there are very, very few chemicals that
17 I know of where the exact interaction with other
18 chemicals is known. That doesn't stop you from
19 coming to a conclusion that those chemicals do
20 work as a synergistic manner to cause a
21 malignancy.

22 Like we know, for example, smoking is a
23 strong risk factor for lung cancer. We know
24 that asbestos is a strong causation risk factor
25 for mesothelioma and lung cancer. And we also

1 know that when you put those two together, it
2 has a synergistic effect to cause lung cancer at
3 higher rates than either of them can do alone,
4 but we do not know how that happens. But we do
5 know that it happens, based on both
6 epidemiologic studies and in vitro studies, and
7 that doesn't stop us from drawing the same
8 conclusion just because we don't know all of the
9 aspects of how they interact together.

10 BY MS. HORAN:

11 Q. I'm pulling back up Exhibit 1 which is
12 your report, and I've turned to page 14. Do you see
13 that?

14 A. Yes.

15 Q. I believe this middle paragraph is where
16 in your report you talk about synergy of the
17 chemicals. I'm happy to go elsewhere if I missed it
18 somewhere else, but I think this is where you cite to
19 it.

20 And the first sentence of that reads: "A
21 significant fact to incorporate into the findings in
22 this case in the context of literature assessing
23 non-Hodgkin lymphoma, including DLBCL, risk and
24 exposure to individual chemicals, is the known impact
25 of exposure to numerous chemicals simultaneously that

1 can have a synergistic effect with respect to
2 carcinogenesis."

3 Did I read that correctly?

4 A. For the most part.

5 Q. What did -- did I say -- did I miss a
6 word?

7 A. No, just your pronunciation. But yeah,
8 you read it correctly.

9 Q. Okay. Well, I apologize for that. But --

10 A. That's okay.

11 Q. At least the words speak for themselves on
12 the page.

13 A. Yes.

14 Q. And your support for this is the increased
15 risk seen in many Camp Lejeune-specific studies and
16 the 2016 Bulka study. Is that fair?

17 A. Well, that's in support of that increased
18 risk. But there -- as I mentioned, there's more
19 that's -- you know, there's hundreds of articles in
20 the literature about the synergistic effects of these
21 types of -- and including these compounds -- with
22 respect to other experimental analyses that have been
23 performed.

24 So yeah, that -- those results support the
25 statements that I made.

1 Q. Has that analysis been done for the
2 contaminants here: TCE, PCE, benzene, and vinyl
3 chloride?

4 A. Well, again, like they've been done -- I
5 don't know -- I can't point to a specific reference
6 as I sit here and try and recall where all four of
7 them and all four of them alone were looked at. But
8 there are innumerable articles, when I did my
9 literature search, that specifically look at
10 combinations of several of them with each other.

11 But that's why -- even having all of them
12 together adds that additional layer of synergy that
13 maybe an individual one alone, you know, wouldn't be
14 as significant.

15 Q. Your second sentence says: "In support of
16 this are the increased risks seen in many of the
17 Camp Lejeune-specific studies, where those
18 individuals exposed to contaminated water containing
19 elevated levels of numerous known carcinogens." Do
20 you see that sentence?

21 A. Yes.

22 Q. And you say that there's an increased risk
23 in many of the Camp Lejeune-specific studies, but
24 that increased risk wasn't universal across all
25 Camp Lejeune studies; fair?

1 A. Well, it wasn't universal upon every
2 specific subgroup that was looked at. But there were
3 also very significant limitations to the study
4 analyses that would have biased those results towards
5 the null. But for the most part, looking at all of
6 the studies, you know, whether they were
7 statistically significant or not, many of them had --
8 if not most of them -- had an increased risk when
9 evaluating non-Hodgkin's lymphoma.

10 Q. Did the fact that that increased risk from
11 the Camp Lejeune studies was not true against -- at
12 all times -- counsel against a synergistic
13 relationship?

14 A. No.

15 MS. GJONAJ: Object to form.

16 THE WITNESS: No, it doesn't.

17 Again, it would depend on the study
18 design, and the -- the way -- mainly the study
19 design and how it was -- how those patients were
20 evaluated.

21 For example, in the more recent Bove
22 study, looking at the age of the patients,
23 they -- like the mean age for the Marines, I
24 think, was like in the mid to late -- 57, 56,
25 maybe. Median or mean was 56 or 57, which is

1 very young for a study looking at an end point
2 of a diffuse large B-cell lymphoma; that is
3 normally something that you see in patients in
4 their mid to late 60s.

5 And in fact, my recollection from that
6 Bove study is that less than 1 percent of
7 patients were over the age of 70 that were
8 Marines. That, in and of itself, would markedly
9 diminish the ability to find any sort of
10 significance in looking for a malignancy that
11 mainly occurs in elderly patients. And it can
12 occur at any age, but it dramatically increases
13 as a patient ages and as their immune system
14 gets weakened by whatever the cause; if it's not
15 TCE or PCE or benzene, it's, you know, natural
16 decreasing immunity.

17 But, you know, Mr. Vidana was in his 40s
18 when he was diagnosed, but that's, you know, not
19 typical of diffuse large B-cell lymphoma as a
20 whole. So that has to be taken into account
21 when looking at the statistics, because if you
22 did a study of smokers that were -- started
23 smoking when they were in their 20s and then you
24 looked at them in their 40s, you are most likely
25 not going to see malignancies in those patients

1 because it's something like diffuse large B-cell
2 lymphoma that takes years to develop after
3 exposure to a carcinogen.

4 So that's -- again, that's something where
5 you have to take everything into account,
6 knowing the underlying biology of the malignancy
7 that we're looking at -- in this case it's
8 diffuse large B-cell lymphoma -- knowing how
9 that particular exposure will cause a
10 malignancy, as I alluded to before, with -- with
11 malignancies that are, let's say, hormone
12 receptor positive.

13 If you're looking at a hormonal exposure
14 and you had a hormonal exposure 30 years ago for
15 a year and then they develop a hormone-positive
16 tumor 30 years later, not in the context of that
17 medication that was a hormone, that's something
18 that would less likely be associated with that
19 malignancy.

20 But when you're talking about a
21 carcinogenic substance that causes genetic
22 mutations that can then take many years in order
23 to manifest into malignancy, that's something
24 that's -- you have to take into account when
25 looking at these.

1 It's -- again, it's the weight of the
2 evidence. It's knowing the biology. It's
3 knowing the underlying mechanistic data. It's
4 incorporating the -- the epidemiologic studies
5 that have been done and also accepting their
6 weaknesses and how the weaknesses in the studies
7 may impact the results that you're seeing.

8 So, you know, it's -- again, it's -- you
9 have to take all that into account when looking
10 at these studies and saying whether a
11 synergistic effect, whether present or not,
12 would have manifested by the time those results
13 would have been published.

14 BY MS. HORAN:

15 Q. Does misclassification bias always tend
16 toward the null hypothesis?

17 A. No, not always. But non --
18 nondifferential exposure bias in this case, as Bove
19 went into, would more likely bias towards null in
20 this example, but not necessarily in any given study.
21 But I believe that the authors specifically mention
22 it and say that it's -- in this example, because of
23 misclassification of who was really exposed and who
24 wasn't and the fact that there were likely nonexposed
25 people in the exposed group, that in this case it

1 would, more likely than not, bias towards the null.

2 Q. Are you offering an opinion on -- or
3 strike that.

4 Why is -- why is that nondifferential?

5 A. Because there are patients that have -- I
6 believe that was a term that they used in Bove, but
7 we could pull that up. Because I was specifically
8 referencing the misclassification bias in that
9 case -- or in that article.

10 Q. Okay. I think we'll probably get to some
11 of the Bove studies a little bit later, so we can --
12 when we get there, we can take a look, if that's
13 helpful to you.

14 Are you offering an opinion on the latency
15 period of diffuse large B-cell lymphoma after first
16 exposure?

17 A. Only in the sense --

18 MS. GJONAJ: Object to form.

19 THE WITNESS: Only in the sense that it
20 varies, based on what you're talking about, the
21 kind of exposure in the literature, like whether
22 it's --

23 BY MS. HORAN:

24 Q. So you're not -- (audio distortion) offer
25 that opinion in your report?

1 A. Sorry, am I getting cut off -- did I get
2 cut off? Can you hear me?

3 Q. I can hear you. I -- I thought you were
4 done answering. But I guess -- please finish your
5 response.

6 A. Well, I don't -- could you repeat the --
7 the question?

8 Q. Sure. You're not offering an opinion
9 establishing a latency period in your opinions in
10 this case, are you?

11 MS. GJONAJ: Object to form.

12 THE WITNESS: Well, I wasn't asked to
13 specifically talk about the latency. But it
14 was -- in this case, the latency is consistent
15 with what I know about diffuse large B-cell
16 lymphoma and his exposure.

17 BY MS. HORAN:

18 Q. Okay. And we'll get to that a little bit.

19 I want to turn back to your report, and in
20 addition to the -- let me put it back on the screen.
21 This is Exhibit 1, and we're on page 14.

22 In addition to the Camp Lejeune studies,
23 you cite to the -- the Bulka 2016 study, is that
24 correct, for your -- in support of your opinion that
25 the chemicals are synergistic? Is that fair?

1 A. Yes.

2 Q. Okay.

3 MS. HORAN: I'm not sure why, but these
4 are not -- but the study is not pulling into the
5 chat.

6 Diana, do you mind if we just go on the
7 screen, or can we go offline so I can try to
8 figure out what's going on?

9 MS. GJONAJ: What study is it?

10 MS. HORAN: It's the Bulka study. It's
11 2016. It's cited in his report.

12 All right. I'm not sure why this one
13 won't pull over.

14 MS. GJONAJ: All right. I'm just seeing
15 if I can pull it for you.

16 (Exhibit 4 was marked for identification.)

17 MS. HORAN: Oh, it'll open on my computer.
18 I just can't seem to drag it into the chat.

19 In the meantime, I'm marking as
20 Exhibit 4 -- this is a study titled "Relations
21 Between Residential Proximity to EPA-Designated
22 Toxic Release Sites and Diffuse Large B-Cell
23 Lymphoma Incidence," from October of 2016. And
24 the lead author is Catherine Bulka.

25 MS. GJONAJ: And if it's okay with you,

1 I'll just copy the link into the chat in case he
2 needs to look at it. You can confirm that it's
3 the same --

4 MS. HORAN: Yeah, absolutely. That's --
5 thank you for -- I'm not sure what happened
6 there.

7 BY MS. HORAN:

8 Q. Dr. Michaels, do you see the Bulka study
9 that you cited in your report on this screen?

10 A. Yes.

11 Q. Okay.

12 The conclusion on page 1 reads:

13 "Proximity to Toxics Release Inventory sites can be
14 linked to increased DLBCL risk as assessed through
15 focal clustering and Poisson regression, and
16 confirmatory studies using geospatial mapping can aid
17 in the further specifying risk factors for diffuse
18 large B-cell lymphoma." Do you see that?

19 A. Yes.

20 Q. And I think I said "diffuse large B-cell
21 lymphoma," but it's actually just "DLBCL."

22 A. Right.

23 Q. How does increased clustering near sites
24 support synergistic relationship of the contaminants?

25 A. Well, I need to rereview. I haven't

1 reviewed this article in a while, so I'll need to
2 rereview the article.

3 Q. Okay.

4 Dr. Michaels, are you rereading the -- the
5 whole study? Or . . .

6 A. I'm rereading parts of the study.

7 Q. Okay.

8 A. I have it pulled up on my end.

9 Q. Okay. Understood. Would you -- would you
10 mind just letting us know when you're -- you're done?

11 A. Sure.

12 So I'm done reviewing the parts that I
13 wanted to.

14 So in this case, it's not just that
15 it's -- it's not that it's, you know, the last
16 sentence you read about the focal clustering, that
17 it -- that's indicative of a synergistic response.
18 It's that they were looking specifically at these
19 different toxic chemicals that are released in the
20 distance from the Toxics Release Inventory
21 facilities, that these patients were developing
22 diffuse large B-cell lymphoma.

23 And so many of these chemicals that
24 they're evaluating in the literature alone have not
25 been associated with malignancies necessarily, or

1 specifically non-Hodgkin's lymphoma, or have been
2 looked at with diffuse large B-cell lymphoma; but
3 it's the presence of all of them and finding
4 statistical significance in this that draws me to the
5 conclusion -- again, in the context of everything
6 else I've talked about, in all of the other in vitro
7 studies that have been done looking at various
8 compounds -- that would support these chemicals in
9 Camp Lejeune acting as synergistic effect.

10 So it's not just anything -- one -- one
11 specific thing that they evaluated in this study.
12 It's taking this study in the context of everything
13 else.

14 Q. Turning to page 5, do you see this
15 "Discussion" section at the bottom of the page?

16 A. Yes.

17 Q. Okay. The first sentence reads:
18 "Numerous studies support associations between
19 occupational toxic exposures and NHL incidence,
20 although considerable controversy remains regarding
21 residential exposures." Did I read that correctly?

22 A. Yes.

23 Q. Do you agree that considerable controversy
24 remains regarding residential exposures?

25 A. Well, I didn't study residential exposures

1 in the sense of -- you know, they -- they reference
2 De Roos, talking about residential proximity to
3 industrial facilities, you know, match geographical
4 areas, study, you know, in -- in Spain residential
5 proximity to industrial plants.

6 That's -- a lot of that doesn't have to do
7 with contamination of water. So I didn't study like
8 industrial exposure. I evaluated -- and so I don't
9 really have a comment on that. What I evaluated was
10 actual known consumption of water that is known to be
11 contaminated, which is very different than that
12 sentence. And it's not something that I specifically
13 looked at. I was looking at it only in the context
14 of Mr. Vidana.

15 Q. Sorry. Strike that.

16 Are you -- was Mr. Vidana exposed in a
17 residential setting? Or are you -- did you only
18 study Mr. Vidana as exposed in an occupational
19 setting?

20 MS. GJONAJ: Object to form.

21 THE WITNESS: So what I am drawing a
22 distinction to is that if you want to pull up
23 the references that -- where 5, 23, and 24, then
24 we can evaluate that sentence and the footnotes,
25 as it's written. Because this is not -- these

1 are not individuals in those three references
2 that were drinking known contaminated water.
3 Those are people that may have been exposed
4 because they are in the vicinity, because they
5 live in the vicinity of an industrial facility.

6 It's completely different, completely
7 different than what we are talking about here.
8 This is an individual -- individual who may have
9 been living on a base and -- and traveling to,
10 you know, different acts -- or was traveling to
11 different parts of the base that are likely
12 contaminated with significant -- significant
13 amounts of the carcinogens that we've been
14 talking about.

15 This is not someone that may or may not
16 have been exposed in -- with a nearby power
17 plant, where there were substances being emitted
18 in the air that -- whether -- and these cases --
19 these are not patients -- and you know, the
20 references 5, 23, and 24, if you want to bring
21 them up, my assessment and my analysis of
22 that -- of those references is that those are
23 not patients that were actually drinking known
24 contaminated water.

25 So it does not apply, and it's not

1 something that I specifically looked at with
2 respect to possible exposure based on proximity
3 to an industrial site. It's -- it's not what
4 we're talking about in this case.

5 BY MS. HORAN:

6 Q. Turning to page 6, do you see the last
7 paragraph?

8 A. Yeah.

9 Q. "Another potential weakness of our study
10 was the lack of quantitative exposures and temporal
11 analyses." Did I read that correct?

12 A. Yes.

13 Q. Dr. Michaels, association is not the same
14 as causation, correct?

15 MS. GJONAJ: Object to form.

16 THE WITNESS: So not every association is
17 a cause. That's correct.

18 BY MS. HORAN:

19 Q. And generating an opinion on causation is
20 not as simple as just having a study that shows a
21 statistically significant association between a
22 substance and a disease; fair?

23 MS. GJONAJ: Objection.

24 THE WITNESS: Of course not. Yeah.

25

1 BY MS. HORAN:

2 Q. So, for example, it's possible to have a
3 study showing a statistically significant association
4 between a substance and a disease, and still not be
5 able to conclude that the substance can cause that
6 disease. Right?

7 A. Yeah, you're -- I mean, this is like
8 simplistic questioning that has nothing to do with --
9 as what I've been testifying to for three hours,
10 which is that -- you know, that's not something that
11 I did, and that's not something that you do.

12 If you're going to assess whether a
13 particular substance is a cause, as I've said
14 probably over a dozen times now, you take the weight
15 of the evidence, and you don't take any one
16 particular result. You have to go based on
17 mechanistic data, epidemiology, biological
18 plausibility, knowing how, you know, carcinogenesis
19 plays into effect in that particular substance, how
20 many substances were involved, what someone's
21 exposure level was, et cetera.

22 There's not just one thing that you go to
23 with respect to specific causation when trying to
24 determine the cause, or a cause, or potential cause
25 of a malignancy. There are lots of things you go to,

1 and you don't just ever take one particular
2 statistical significance from a study and draw
3 conclusions based on that.

4 Q. The authors of an epidemiological study,
5 they provide statistical results that indicate a
6 level of risk that's observed in that study; fair?

7 A. Could you repeat that?

8 Q. Sure. The authors of an epidemiological
9 study provide statistical results that indicate the
10 level of risk that they observed. Is that fair?

11 MS. GJONAJ: Object to form.

12 THE WITNESS: The -- are you asking a
13 general question? I don't know if you're
14 talking about Bulka or . . .

15 BY MS. HORAN:

16 Q. Yes. No, I'm sorry. Did I take -- yeah,
17 no. We're done with Bulka. I'm just asking
18 generally if -- your opinion on that, and I'm happy
19 to repeat it.

20 A. Yeah, could you repeat it?

21 Q. Sure. And Dr. Michaels, I understand
22 the -- your weight of your evidence, but we're just
23 going through to understand kind of how you weigh the
24 different pieces and the limits of how you do it.
25 So, you know, understanding the different pieces, I

1 understand that you've weighed much to get to your
2 final conclusion, but that's just what we're doing
3 here.

4 So the question I asked was, the authors
5 of an epidemiological study provide statistical
6 results that indicate the level of risk that they
7 observed. Isn't that fair?

8 A. I would say, generally speaking, that's
9 one of the things that they do in an epidemiological
10 study.

11 Q. And it's not possible, from this
12 information alone, to say whether any particular case
13 of disease in a study was caused by the exposure
14 versus some other risk factor. Fair?

15 A. Yes, some -- some studies are better than
16 others in excluding -- or trying to exclude other
17 confounding variables. And it would depend on how
18 the study is done and the power of the study. But
19 again, when assessing -- the whole reason for the
20 study is to fight against the concept of anecdotal
21 evidence, just based on one patient in a clinic. And
22 so the more -- the more studies show, the greater
23 number of subjects, the less likely a result is going
24 to be found to be inaccurate.

25 But it -- again, in the sense of assessing

1 causation for any individual disease that arises
2 within any individual epidemiologic study, there's no
3 way to know with 100 percent certainty whether that
4 disease, from that subject, was caused by the
5 exposure. That's why you have to go based on all of
6 the other data when evaluating the overall weight of
7 the evidence.

8 Q. And the risk ratio indicates the level of
9 association that's observed there?

10 A. In that particular study, based on
11 whatever limitations or strengths of the study, yes,
12 that's generally how it's interpreted.

13 Q. And 1.0 indicates no association?

14 A. Generally a 1.0 -- yes. Generally, that's
15 what it indicates, is no association with that
16 particular parameter.

17 Q. And what level of increased risk reflects
18 a modest association, in your view?

19 MS. GJONAJ: Object to form.

20 THE WITNESS: Well, again, it's -- I
21 wouldn't -- it would depend on the study, and it
22 would depend on -- it would just depend on the
23 study and how the study is performed.

24 I -- I wouldn't -- you know, subclassify
25 it as modest, mild, marked, in that setting

1 without knowing the other co-variables of the
2 study, and what the study was specifically
3 looking at, and the limitations of the study,
4 and the confidence intervals.

5 I think it's hard, just in a vacuum, to
6 say that a particular relative risk of say 1.2,
7 or whatever, would increase -- would cause you
8 to say that there's a moderate increased risk or
9 moderate increased association in that
10 particular parameter.

11 BY MS. HORAN:

12 Q. So in your opinion, it's very
13 study-specific to determine whether there's a modest
14 or sizeable -- or whatever you want to characterize
15 it -- association? It's very specific to the study?

16 MS. GJONAJ: Object to form.

17 THE WITNESS: I would say it varies, based
18 on -- you know, some authors have set
19 different -- different parameters on what they
20 consider modest, what they consider marked.

21 I would say a lot of people use 1.2, but I
22 don't think that that's a uniform. I don't
23 think there's anything uniform in the scientific
24 literature that says a relative risk or odds
25 ratio or hazard ratio, or whatever, of X number

1 corresponds to a moderate risk. I think it's
2 very study-dependent.

3 BY MS. HORAN:

4 Q. Confidence intervals evaluate how precise
5 that risk assessment is. Fair?

6 MS. GJONAJ: Object to form.

7 THE WITNESS: I would say that's one of
8 the -- the elements that goes into assessing how
9 precise the risk is.

10 BY MS. HORAN:

11 Q. What else does a confidence interval do
12 besides evaluate how precise the risk estimate is?

13 A. Well, it can show you -- you know, it can
14 be indicative of the power of the study, the -- the
15 small numbers of the study, but it doesn't
16 necessarily mean that it's imprecise. It could just
17 be based on the overall study design.

18 It doesn't mean, if you have a wide
19 confidence interval, that it necessarily completely
20 takes away or minimizes the results of the study. I
21 think, again, you have to take -- if you only have a
22 few cases, you're going to to have a wide confidence
23 interval. That doesn't mean that it was necessarily
24 imprecise.

25 Q. A confidence interval that includes 1, or

1 the null, suggests no association; is that fair?

2 A. No. It's not fair.

3 Q. Why not?

4 A. Because that's too simplistic. I mean,
5 you don't -- you don't go based on -- if it
6 includes 1, that doesn't mean that you would throw
7 out those results. Bradford Hill -- that was part of
8 a whole Bradford Hill analysis.

9 If there's a general trend, that doesn't
10 mean there's no association. That means you take --
11 you -- in that particular case, it's not
12 statistically significant. That doesn't mean that
13 there's no association. You have to take all of the
14 results and look at them in tandem, or together.

15 For example, we do this constantly in the
16 laboratory, where there's something called "Westgard
17 rules," where we look at proficiency testing to make
18 sure that our analytes are functioning properly -- or
19 properly, and our machines that we're using -- and if
20 you have several in a row that are not outside of the
21 confidence interval, the 95 percent, you know,
22 confidence interval, but there's several in a row
23 that are maybe one standard deviation or greater,
24 that -- on one side of the curve.

25 So say, for example, you have multiple

1 studies that have shown that diffuse large B-cell
2 lymphoma or non-Hodgkin's lymphoma, or whatever
3 malignancy, has a relative risk of 1.3, 1.4, 1.2, and
4 none of them are, by themselves, statistically
5 significant, that's not something to dismiss. That's
6 something that in the lab, when we have several that
7 are on one side, that's something to alert us that
8 there could be a problem with the analyzer or the
9 analyte that we're looking at, because there is a
10 trend towards an abnormality or a trend towards a
11 skewing of the data or a skewing of the analyte, in
12 the case of the lab.

13 And we do that in the literature as well,
14 where again, depending on the power of the study,
15 depending on the confounding variables, depending on
16 the methods that are used, you may not, in any
17 individual study, be able to have a confidence
18 interval that doesn't include 1, but it's -- it shows
19 an increased relative risk or an increased hazard
20 ratio.

21 And when you see multiple of those,
22 combined with what you know about the biological
23 plausibility or the temporality of the exposure,
24 whatever, allows you to come to a general conclusion
25 about causation, whether it's, you know, at least as

1 likely as not, or some other standard.

2 So it's something where you have to take
3 everything into account. And so I wouldn't just
4 automatically answer your question by saying it's
5 something as not -- includes 1 in a confidence
6 interval, that there's no association, because it's
7 not that simplistic.

8 Q. Okay. For a particular study, if a
9 confidence interval includes 1 or the null, does it
10 suggest that for that study, there's no statistically
11 significant association? Is that fair?

12 A. It says that for that study, that
13 particular parameter is not statistically
14 significant. For that study.

15 Q. Okay. When the odds ratio increases as
16 exposure increases, you can be more confident that an
17 association is present. Is that fair?

18 MS. GJONAJ: Object to form.

19 THE WITNESS: I would say that depends on
20 what association, what kind of parameters you're
21 looking at. Basically you're talking about a --
22 a dose response, and a lot of times you don't
23 have the luxury of having a study designed based
24 on the numbers, or based how -- on the study
25 design, on being able to separate those exposure

1 categories to the level that you would see a
2 dose response.

3 So when you have a study that does not
4 have a dose response, I don't think that
5 necessarily changes anything.

6 BY MS. HORAN:

7 Q. If you have a study that shows no dose
8 response, you said that doesn't change anything.
9 What did you mean by that?

10 A. Depending on the study. You have to look
11 at the study design. You have to look at the numbers
12 of people that were in the different groups. You
13 have to look at how they were assigned to those
14 groups. And if there's only a few people in the
15 high-dose group and then there's 50 people in the
16 low-dose group and 100 people in the medium-dose
17 group, or whatever, you may not see it -- you may see
18 it go up, and then it goes down, because of those two
19 people that were in the high-dose group that maybe
20 didn't have disease, or whatever. Like -- you have
21 to look at the entire study before you make an
22 evaluation about whether dose response in that study
23 is valid or not.

24 Q. Other than the number of people in each
25 dose group, what else would you look at?

1 A. How they were assigned to those dose
2 groups. So how were they determining the exposure?
3 Is it based on self-reporting? Is it based on, you
4 know, location somewhere? Is it based on
5 prescription data? You know, is it based on job
6 title? Is it based on duration?

7 Like there's all these different things
8 you need to look for when incorporating or trying to
9 come to an evaluation about whether the presence or
10 absence of a dose response is meaningful.

11 Q. You mentioned whether the exposure was
12 self-reporting. Is it -- what's the relevance of
13 that? Is it -- become less reliable if it's
14 self-reporting or less trustworthy than other means
15 of determining exposure or what -- what's your
16 assessment of -- of a study that is self-reported?

17 A. Well, it --

18 MS. GJONAJ: Object to form.

19 THE WITNESS: It depends. So it depends
20 on what you're talking about. So in the setting
21 of certain medications, if they're over the
22 counter, you often have recall bias, where
23 someone -- whether it's a medication or an
24 over-the-counter, you know, product that once
25 someone has the disease, they may recall

1 something, you know, because they have the
2 disease, and they now are more aware of it.

3 And they might think that, "Oh, well, you
4 know, yeah, I was -- I took that, you know -- I
5 used that product for four years," where someone
6 who used it four years -- for four years,
7 30 years ago, who didn't develop the disease,
8 maybe would not have thought about it.

9 So sometimes it's -- it's helpful, but
10 it's -- there's always the potential for recall
11 bias. And so it really just depends on the
12 study, and what people can recall, and what
13 you're talking about. If you're talking about
14 malignancies, you know, sometimes if you don't
15 have medical records and a person is supposed to
16 report their malignancy and say, "Oh, yes, I had
17 ovarian cancer," well, maybe they didn't really
18 have ovarian cancer, and they actually had
19 endometrial cancer, and their understanding was
20 that it was ovarian cancer.

21 So it really depends on -- on what you're
22 looking at to be able to say whether that would
23 have an effect on the quality of the data or
24 not.
25

1 BY MS. HORAN:

2 Q. Going back to Exhibit 1, which is your
3 expert report -- do you see it on the screen?

4 A. Yes.

5 Q. Your general causation opinion, is that
6 found in Section VII of your report?

7 A. Well, again, this was a --

8 MS. GJONAJ: Object to form.

9 Sorry.

10 THE WITNESS: This was a specific
11 causation report. I have general -- I have
12 statements in there that reflect general
13 causation, but this is a specific causation
14 report for Mr. Vidana.

15 And as I mentioned earlier, and addressed
16 earlier, I did review other general causation
17 reports from the Plaintiffs, including Bird and
18 Felsher, et cetera; and while I didn't --
19 everything that they say in their reports I
20 confirm in my assessment. I didn't necessarily
21 rely on them to form my opinions. I did my own
22 independent research. And all of the opinions
23 that they expressed in their reports I agree
24 with.

25 And so I wouldn't really say that there's

1 a -- a section of my report that specifically
2 points out general causation, because this is a
3 specific causation report that happens to deal
4 with issues that maybe are applicable to general
5 causation.

6 BY MS. HORAN:

7 Q. Sure. I think you just said you did your
8 own analysis to determine if you agreed with their
9 general causation opinions; fair?

10 A. Well, in the -- in the context and in the
11 process of going through my own evaluation of the
12 literature, and then reviewing their general
13 causation reports, the opinions that they expressed
14 in their general causation reports are opinions that
15 I agree with.

16 Again, I'm not relying on things that they
17 put in there that -- you know, studies and examples
18 of data that they put in their analysis of the
19 literature and assuming that it's correct. I did my
20 own independent literature search. I did my own
21 independent evaluation of the -- of the analyses that
22 they also happened to reference.

23 And I agree with what is in their reports,
24 but I'm not relying on their reports solely to form
25 my opinions that happen to relate to general

1 causation, because this is a specific causation
2 report in relationship to Mr. Vidana.

3 Q. Okay. So there's no section of your
4 report that includes general causation analyses and
5 opinions, the -- the part you did on your own?

6 A. The part that I did on my own has opinions
7 that are -- not every sentence in everything that I
8 wrote is applicable -- or is specific to Mr. Vidana.
9 So there are going to invariably be aspects of my
10 report that are applicable to a general causation
11 opinion. But this is a -- as it's written on there,
12 it's a specific causation expert report of mine.

13 Q. The independent analysis -- or strike
14 that.

15 Were you aware that this case has expert
16 discovery phase such that general causation was
17 Phase II and specific causation is Phase III?

18 A. I'm not an attorney, so I don't know the
19 legalities of -- of phases. I just know that this
20 is -- that my report that I did, I did it on the
21 timeline that I was asked to do. I evaluated the
22 literature independently. I reviewed general
23 causation reports. And I came to my own conclusions
24 that include -- that are present in this specific
25 causation expert report of mine.

1 Q. Turning to page 1 of your report, you have
2 a "Summary of Opinions" on page 1, and it goes into
3 page 2. Do you see that?

4 A. Yes.

5 Q. Okay. And these are the summary of the
6 opinions you intend to offer at trial?

7 A. Again, these are opinions that I still
8 hold as I sit here today. But again, at trial,
9 whatever I'm asked, if it's an opinion -- if it's a
10 subject that I have an opinion on, based on my review
11 of the literature and my report, then it's something
12 that I would testify to.

13 Q. Your first opinion is that "Jose Vidana
14 was diagnosed with diffuse large B-cell lymphoma in
15 October of 2007." Did I read that correctly?

16 A. You read that correctly.

17 Q. Mr. Vidana's pathologist determined he was
18 diagnosed with diffuse large B-cell lymphoma; fair?

19 A. Well, I think the term -- you know, again,
20 as I've mentioned, the terminology has changed. But
21 I think they -- they actually said "large B-cell
22 lymphoma," but it was basically analogous to diffuse
23 large B-cell lymphoma, based on the immunophenotype
24 that they reported in their pathology report.

25 Q. And you agree -- do you agree with

1 Mr. Vidana's pathologist on his diagnosis?

2 A. I didn't review -- I don't think the
3 slides were available. But based on everything that
4 I was able to evaluate, I have no reason to disagree
5 with it.

6 Q. So you reviewed the pathology report but
7 not the slides; fair?

8 A. Correct.

9 Q. And you -- to the best of your
10 understanding, is Mr. Vidana's diagnosis in dispute
11 in this case?

12 A. Not that I'm aware of.

13 Q. You're not offering an opinion on
14 Mr. Vidana's treatment or whether it was appropriate;
15 fair?

16 A. That's fair.

17 Q. Your second opinion is that "Diffuse large
18 B-cell lymphoma is a subtype of non-Hodgkin
19 lymphoma." Did I read that correctly?

20 A. That's correct.

21 Q. And it's not in dispute in this case that
22 diffuse large B-cell lymphoma is a subtype of
23 non-Hodgkin's lymphoma; fair?

24 MS. GJONAJ: Object to form.

25 THE WITNESS: That's my understanding.

1 Again, there's several different -- you know,
2 diffuse large B-cell lymphoma has several
3 different subtypes and -- and, you know, in
4 general, it would be diffuse large B-cell
5 lymphoma NOS. But in general, yeah, that's
6 correct; the diffuse large B-cell lymphoma,
7 speaking in general terms, is a subtype of a
8 non-Hodgkin's lymphoma.

9 BY MS. HORAN:

10 Q. Your third opinion is that "Chemicals
11 found in the water in Camp Lejeune, including
12 trichloroethylene (TCE), tetrachloroethylene (PCE),
13 and benzene, are carcinogens and have been found to
14 increase the risk for development of various
15 non-Hodgkin lymphomas in both animals and humans,
16 including diffuse large B-cell lymphoma." Did I read
17 that correctly?

18 A. Yes.

19 Q. Is that opinion opinion on general
20 causation?

21 A. Well, it's an opinion based on the
22 specific cancer that Mr. Vidana has. But again, it
23 applies -- I can't have a specific causation that
24 Mr. Vidana's malignancy was caused by his exposure to
25 a particular carcinogen without having the baseline

1 knowledge that that malignancy can at all be related
2 to those exposures, those chemical exposures.

3 So you can't really have, by definition, a
4 specific causation in any individual case without
5 having an underlying general causation that that can
6 happen.

7 Q. Sure. And your Opinion 3 is your opinion
8 that, generally, these chemicals can cause diffuse
9 large B-cell lymphoma; fair?

10 A. That's correct. Generally, they can.

11 Q. Are you offering an opinion on how much it
12 increases the risk?

13 MS. GJONAJ: Object to form.

14 MS. HORAN: That's fair. Let me rephrase.
15 BY MS. HORAN:

16 Q. Are you offering an opinion on how much
17 exposure to TCE, PCE, and benzene increases the risk
18 of developing diffuse large B-cell lymphoma?

19 MS. GJONAJ: Object to form.

20 THE WITNESS: Not in the sense that
21 Mr. Vidana -- in his case, it was -- he
22 developed diffuse large B-cell lymphoma, so
23 that's kind of a moot point about how much it
24 increases risk for other people. I'm
25 specifically talking about Mr. Vidana and

1 whether his exposure, in my opinion, was
2 sufficient to be, at least as likely as not, a
3 cause for his lymphoma, which, in my opinion, it
4 is.

5 And again, that's based on my review of
6 the epidemiology in conjunction with the
7 mechanistic data. It's not something based on
8 one particular number that was noted in a
9 particular observational study or a particular
10 duration.

11 BY MS. HORAN:

12 Q. Your fourth opinion -- let me turn to
13 page 2 -- is that "Jose Vidana spent time at
14 Camp Lejeune and, over the course of approximately
15 six weeks was exposed to water contaminated with
16 chemicals including TCE, PCE and benzene." Did I
17 read that correctly?

18 A. Yes.

19 Q. You're not opining on DCE, correct?

20 A. Correct.

21 Q. And your fifth opinion is that "The
22 contaminated water to which Mr. Vidana was exposed
23 during his time in Camp Lejeune was as likely as not
24 a cause of his non-Hodgkin lymphoma." Did I read
25 that correctly?

1 A. That's correct.

2 Q. I believe you might have mentioned this
3 earlier, but you were instructed to use the "at least
4 as likely as not" standard?

5 MS. GJONAJ: Object to form.

6 THE WITNESS: I wasn't instructed to. I
7 was told that that was the standard and whether
8 it was my opinion that that applied to this
9 case. But I wasn't instructed to use it.

10 BY MS. HORAN:

11 Q. What distinction are you drawing between
12 my use of the word "instructed" and I believe your
13 answer, which is that you were told to use it?

14 A. No, no, no. So I was told that that was
15 the standard in this case; not being told to use it.
16 If I had wanted to use it -- a different terminology,
17 it would depend on what is going on in that
18 particular litigation or that court or that circuit,
19 whatever terminology they are using.

20 So I wasn't told "We need a report where
21 you come to this opinion. We are instructing you to
22 use this opinion." I was told that is the standard
23 in this litigation, that -- and that "You come up to
24 your own conclusions about whether you feel like the
25 data and your evaluation of all of the studies and

1 the weight of the evidence have you form an opinion
2 where you can be confident in using that
3 terminology."

4 But that's the distinction I'm drawing. I
5 wasn't instructed, "You need to use it," or told,
6 "You need to use it." I was told, "Do your own
7 evaluation. This is the standard that's being used
8 in the court, and you come up with a report about
9 whether you feel comfortable or if you have the
10 opinion that you can say that, with a reasonable
11 degree of medical certainty, in this particular case
12 for Mr. Vidana."

13 Q. Sure. So I -- you were not instructed as
14 to your conclusion, but you were instructed that "at
15 least as likely as not" is the standard being used in
16 this case?

17 A. Yes. I was instructed or told that that
18 was the standard being used in this case, which I
19 independently verified.

20 Q. You said you independently verified. What
21 did you mean by that?

22 A. Well, when I was reading -- I believe when
23 I started reading about this standard, that it was
24 specifically said in the Camp Lejeune Act of 2022
25 or -- I don't remember what it was, but I saw that

1 wording used.

2 Q. Other than the Camp Lejeune Justice Acts,
3 do you recall seeing the "at least as likely as not"
4 standard elsewhere?

5 A. I just believe that I've seen that before
6 with one of the DOJ's experts, Dr. Goodman. I
7 believe she's used that prior to this litigation,
8 actually. So I didn't think that it was something
9 that was in dispute by the United States.

10 Q. Other than Dr. Goodman's study, where you
11 think "at least as likely as not" was used, have you
12 seen the "at least as likely as not" used in other
13 peer-reviewed published studies?

14 A. Other than the defense's own expert, and
15 in the -- the Congressional Act, I don't recall if
16 I've specifically seen that. Because generally in
17 the medical literature, you don't use that
18 terminology; that's more of a legal term. Even "more
19 likely than not," those are legal terms. So you
20 don't tend to see those, generally speaking, in
21 medical literature.

22 Q. Do you use "at least as likely as not"
23 with patients?

24 A. Not in those exact words, but with respect
25 to talking at tumor boards, or speaking with

1 clinicians, I would say probably, or likely. So --
2 but I -- again, that's a legal terminology that would
3 not really fit into a pathology report, but we use
4 "consistent with," "suggestive of."

5 Those are all -- and that's used daily.
6 Those are all analogies to, you know, "most likely,"
7 "most consistent with," "most suggestive of,"
8 "suggestive of," you know, "diagnostic of," "most
9 diagnostic of." We use a variety of terminologies
10 that are analogous to the legal terms. We just use
11 them in the setting of a -- medical diagnostic
12 reports.

13 Q. The medical terms that you said you use
14 daily, are you saying all of those are analogous to
15 "at least as likely as not"? Or if not, then what
16 are the medical terms that you would say are
17 analogous to "at least as likely as not"?

18 A. I would say the most -- the closely
19 associated would be "suggestive of," where maybe it's
20 like a 50-50 in a differential diagnosis, would
21 include, you know, two different things that seem
22 50-50, or could be more than that.

23 You know, "you favor" -- "a favor" -- "you
24 favor one"; it's another terminology we use. "Favor
25 this." "Favor that."

1 So I would say that there's a variety of
2 terms that are used. I would say that "consistent
3 with" would not be analogous to "at least as likely
4 as not." "Consistent with" would be more analogous
5 to "more likely than not." I would say it would be
6 the most closely mirrored of the legal versus medical
7 terminology.

8 It really depends on the context. All of
9 this depends on the context.

10 Q. You've reviewed the Camp Lejeune Justice
11 Act; fair?

12 A. Yes.

13 Q. Do you recall when you reviewed the
14 Camp Lejeune Justice Act?

15 A. Before I was involved in this litigation,
16 and then after -- again, after November of 2024, when
17 I was, you know, asked to look at this case.

18 Q. And you're not interpreting legal
19 language, correct?

20 A. I don't know what you mean by
21 "interpreting legal language."

22 Q. So I think -- so I believe you said that
23 you understood that "at least as likely as not"
24 standard comes from the Act, correct?

25 A. Correct.

1 Q. Okay.

2 A. Well, that's one of the places I've seen
3 it. I think we already established the Department of
4 Justice expert, Dr. Goodman, has also used it, I
5 believe.

6 Q. Sure. And you're not trying to interpret
7 the "at least as likely as not" standard from a legal
8 perspective, correct?

9 A. Well, just in the sense that I speak
10 English, and I know how to interpret words. So I'm
11 not -- it's not like it's in French, and I'm having
12 someone translate it for me. It's English, and I was
13 born in this country, and I know how to speak
14 English. So I know what "as least as likely as not"
15 means.

16 Q. Sure. And what we've been talking about,
17 you've told me some analogous medical terms. You've
18 taken this language and you've translated it to your
19 profession of medicine; fair?

20 A. I haven't -- I would not say that I've
21 translated it, because all of the terms that I used,
22 I did not use in this -- my specific causation
23 report.

24 But I am -- what -- I'm drawing the
25 analogy to that, but again, it's not -- it's not a

1 perfect analogy, because I wouldn't say that the
2 percentages would be exactly the same. And it would
3 depend on how someone was using those medical terms
4 or how someone is interpreting the medical
5 terminology in the context of a particular -- the
6 rest of the comment or the rest of a case.

7 It's -- it's much more convoluted and
8 complicated and nuanced than just translating in the
9 medical version "at least as likely as not" and a
10 medical term that I would use. But what I'm telling
11 you is that I -- I am confident that I understand
12 what "at least as likely as not" a cause means, and
13 that I'm comfortable expressing that opinion in this
14 case, with Mr. Vidana and his exposure at
15 Camp Lejeune, being at least as likely as not a cause
16 for his non-Hodgkin lymphoma, in this case a large
17 B-cell lymphoma.

18 Are you there?

19 Q. Yeah, I'm here.

20 A. Okay. I thought I was frozen. Sorry.

21 Q. No, sorry. Just looking down. I'm trying
22 to make sure I'm streamlining it as much as I can.

23 Have you ever used the standard "at least
24 as likely as not" in your own publications?

25 A. No. Again, as I mentioned, it's not

1 something that's typically used in most published
 2 medical literature, and it's not something that I
 3 have used before. I've also never used "more likely
 4 than not" or "a reasonable degree of medical
 5 certainty." Those aren't things that are generally
 6 included in published medical literature, and
 7 certainly not published medical literature with
 8 respect to the scientific articles that I published.

9 Q. We have been going about an hour and
 10 15 minutes. Do you mind if we take just a quick
 11 break?

12 A. Well, can we take a little bit longer of a
 13 break, so I can get lunch? Or . . .

14 Q. Oh, absolutely.

15 MS. HORAN: Do you want -- let's go off
 16 the record, and we can figure out the -- the
 17 timing.

18 VIDEOGRAPHER: Going off the record at
 19 1:15 p.m.

20 (A luncheon recess transpired from
 21 1:15 p.m. until 2:01 p.m.)

22 VIDEOGRAPHER: Back on the record at
 23 2:01 p.m.

24 BY MS. HORAN:

25 Q. I'm going to put back on the screen your

1 expert report, Dr. Michaels. And this is Exhibit 1,
2 and I'm going to turn to page 5 and 6, which is --
3 and specifically Section VI.

4 Do you see that on the screen? It's the
5 section entitled "Contaminants Found Within
6 Camp Lejeune Water."

7 A. Yes.

8 Q. Okay. And you state: "In forming my
9 opinions regarding Mr. Vidana's exposure to
10 carcinogens while stationed at Camp Lejeune, I am
11 relying on a report titled 'ATSDR Assessment of the
12 Evidence for the Drinking Water Contaminants at
13 Camp Lejeune and Specific Cancers and Other
14 Diseases,' released on January 13, 2017. I have also
15 been provided with the expert report and appendices
16 of Morris L. Maslia, PE, and initially incorporated
17 the values in that report in forming my opinion."
18 Did I read that correctly?

19 A. Yes.

20 Q. Okay. The ATSDR report you referenced in
21 this section, the 2017 assessment of the evidence,
22 that's the same report that's -- we've talked about
23 several times today and was marked as Exhibit 3,
24 correct?

25 A. That's my understanding, correct.

1 Q. Other than the ATSDR report and
2 Mr. Maslia's expert report, did you rely on any other
3 sources in forming your opinion regarding
4 Mr. Vidana's exposure to carcinogens while stationed
5 at Camp Lejeune?

6 A. Well, we addressed this earlier with
7 respect to my "Materials Considered" list. But, you
8 know, I did review -- I didn't review Dr. Reynolds's
9 final draft, because it was finalized after mine,
10 with respect to what's listed on my "Materials
11 Considered" list -- I shouldn't say "final draft"; I
12 should say "final signed report."

13 But I did review a prior prefinal draft
14 with respect to the water modeling and exposure that
15 she looked at for Mr. Vidana.

16 Q. So you relied on a draft of Dr. Reynolds'
17 report?

18 A. Right. It was her actual data, and it did
19 not -- that aspect that I -- from what I was able to
20 see, did not change with respect to the numbers that
21 she calculated and her, you know, assessment of his
22 exposure with respect to number of days over the
23 course of that time period.

24 Q. So you're saying that Dr. Reynolds did not
25 change the number of days from the draft you saw to

1 the final?

2 A. No, I'm just saying that I did not notice
3 that there was any change from what I reviewed to the
4 final report.

5 Q. Okay. And you don't cite to Dr. Reynolds
6 in your expert report; fair?

7 A. I don't cite to it because I don't --
8 there wasn't a final report. I actually don't cite
9 to any of the, you know, general causation reports or
10 anything. But it was simply one aspect of what I
11 looked at, but I included it in my "Materials
12 Considered" list.

13 Q. Sure. But you don't have any analysis in
14 your report where you analyzed Dr. Reynolds'
15 conclusions to incorporate them into your final
16 analysis?

17 MS. GJONAJ: Object to form.

18 THE WITNESS: Could you repeat that?

19 BY MS. HORAN:

20 Q. Sure. There's nowhere in your report that
21 references Dr. Reynolds, or her conclusions; fair?

22 A. I don't reference her conclusions, because
23 again, they were not finalized by the time of my
24 report. But they -- there were aspects of her report
25 that supported my opinions that were not otherwise

1 modified by either her final draft or the absence of
2 them.

3 Q. Okay. You say they were -- there were
4 parts of her report that supported your report? Is
5 that what you said?

6 A. Well, no -- what I'm saying is her -- her
7 evaluation of the levels that Mr. Vidana was exposed
8 to was consistent with my understanding of his
9 exposure level and the degree of his exposure.

10 Q. Okay. You don't have the levels or the
11 numbers that Dr. Reynolds includes in her report
12 anywhere in your report; fair?

13 MS. GJONAJ: Object to form.

14 THE WITNESS: No, that's not fair. And
15 let me tell you -- let me tell you why.

16 BY MS. HORAN:

17 Q. Sure.

18 A. Because on page 6, where it -- I talk
19 about the last sentence of that first paragraph,
20 that -- you know, it's before Section VII. I say,
21 "During the period of time when Mr. Vidana was at
22 Camp Lejeune, the concentrations in finished water
23 ranged from" -- and I include the -- the ranges.
24 Those are all ranges that she also had in her tables
25 that she listed in her report.

1 So as I was saying, they are -- what I
2 reference in here is consistent with the tables that
3 she has in her report.

4 Q. So you and Dr. Reynolds relied on the same
5 data from Mr. Maslia's report?

6 A. That's my understanding.

7 Q. Okay. And what is your understanding of
8 the opinions that Dr. Reynolds is offering in this
9 case, outside of the data she's relying on?

10 MS. GJONAJ: Object to form.

11 THE WITNESS: Could you repeat that?

12 BY MS. HORAN:

13 Q. Sure. Is it -- what is your understanding
14 of what opinions Dr. Reynolds was offering in her
15 report that you saw after you completed your expert
16 report?

17 MS. GJONAJ: Object to form.

18 THE WITNESS: No. So I -- again, I saw
19 her -- her draft before I completed my expert
20 report. By definition, her completed -- and
21 maybe the -- the draft that I saw -- because it
22 looked substantially similar; I didn't notice
23 any differences. Maybe her signed report on
24 February 7th, or whenever it was, was exactly
25 the same as the version I saw.

1 I was simply evaluating her analysis of
2 the exposure levels based on the time period
3 Mr. Vidana was at Camp Lejeune, based on the
4 amount of time he would have likely spent at
5 Hadnot Point, based on his deposition testimony,
6 the number of hours he would have been awake,
7 his degree of consumption, et cetera.

8 So those are the -- I guess her opinions
9 were based on what she chose for the number of
10 days in a week that he would have had an
11 exposure, and corresponding that to the total
12 amount of micrograms that he would have been
13 exposed to over the course of his time stationed
14 there.

15 So those are the extent of the opinions
16 that I can recall, as I sit here, that I
17 evaluated with respect to her report.

18 BY MS. HORAN:

19 Q. Sure. So you evaluated Dr. Reynolds'
20 opinions on his exposure level. But did you rely on
21 them in forming your opinion?

22 A. Yes. I relied on her data that she had
23 with respect to, you know, what she listed, and it
24 substantiated my previously held interpretation of my
25 opinions with respect to his deposition testimony,

1 with respect to number of days and the amount of
2 consumption that he would have been considered to
3 have, based on his level of exposure and his
4 location.

5 Q. Dr. Reynolds' conclusions about exposure
6 levels in terms of the micrograms that she determined
7 for Mr. Vidana, those microgram totals don't appear
8 anywhere in your report; fair?

9 MS. GJONAJ: Objection to form.

10 THE WITNESS: The totals, correct. The
11 totals don't appear. Again, I reviewed her
12 draft that -- during the time period that
13 Mr. Vidana was at Camp Lejeune, I included the
14 concentrations that would have been in May and
15 June of '83 for the four volatile organic
16 compounds that we're talking about, that I
17 addressed in my report.

18 But as far as the total amount, it wasn't
19 really something that was, in my opinion, based
20 on all of the other factors, something that
21 needed to be in my report, based on my analysis
22 of the weight of the evidence of everything
23 else.

24 BY MS. HORAN:

25 Q. You say the total amount didn't need to be

1 in your report, based on the evidence of everything
2 else. What do you mean by that?

3 A. So what I mean by that is my opinions
4 were -- would not have been swayed, knowing what the
5 baseline level was in the water in May and June, that
6 there was nothing else that I felt like, in
7 combination with the type of malignancy he had, with
8 the -- the temporality of his exposure, with the lack
9 of any other associated causal risk factors in his
10 case, with the known mechanistic data of what he
11 would have been exposed to -- specifically the
12 genotoxicity of the volatile organic compounds, the
13 immune dysregulation that's known to occur in
14 those -- in those contexts with those particular
15 carcinogens, that immunosuppression, the depression
16 of CD4 and CD8 B-cells and T-cells, the reactive
17 oxygen species that are associated with those
18 carcinogens, All of that, in combination, was strong
19 enough and the weight of evidence was strong enough
20 that I didn't feel the need to add an additional
21 layer of an analysis that she performed to say that
22 this number of total micrograms adds something to my
23 opinion.

24 My opinion was already strong enough based
25 on what it was. All I'm doing right now is

1 clarifying, for you and for the record, that I
2 reviewed her draft. I did not review her final
3 report. And the numbers that she uses to come up
4 with her overall exposure data were comparable and
5 consistent with the numbers that I used, which we
6 both got from the same sources. That's all I'm
7 saying.

8 Q. You say they were comparable to the
9 numbers you used. What numbers are you referencing?

10 A. The last sentence that I just -- or the
11 second-to-the-last sentence that I had just read.

12 Q. So you're referencing Mr. Maslia's numbers
13 that you've included in your report?

14 A. Correct. And if we want to pull them up
15 side by side to make this easier for you, we can go
16 side by side and show her chart and the numbers that
17 I'm listing in written form on page 6 of my report,
18 if that makes it easier.

19 Q. No, I understand. I'm just understanding
20 what pieces of her report you used and relied on and
21 which ones you didn't feel the need to use and rely
22 on.

23 And so you found the -- the number of
24 days, which I believe you testified that -- earlier
25 today, that your report said May 12th, and

1 Dr. Reynolds' or someone else's report said May 8th.
2 And so that was a discrepancy that you found when you
3 were reviewing your report. Is that fair?

4 MS. GJONAJ: I'm just going to object to
5 the first part of -- I think before you asked
6 the question, I think it misrepresented his
7 prior testimony.

8 Go ahead.

9 THE WITNESS: Well, what I had said was
10 that -- what I had said was that when I was
11 reviewing her -- her chart, that she had said
12 May 8th was the start, and I had said May 12th
13 was the start. And I wasn't sure, based on --
14 I -- mine might have been a typographical error.
15 I noticed that after the report was done, which
16 is why I pointed it out.

17 BY MS. HORAN:

18 Q. Sure. Did you do anything to investigate
19 whether May 8th or May 12th is the correct start date
20 for Mr. Vidana's time at Camp Lejeune?

21 A. I don't remember -- I just recently
22 noticed it, and I haven't had the chance to go back
23 and try and get his original records to see what it
24 was.

25 So I -- again, I -- I think it was a

1 typographical error, but I -- I can't say with
2 100 percent certainty as I sit here. Regardless, it
3 doesn't change the substance of my opinions.

4 Q. And you and Dr. Reynolds both used
5 Mr. Maslia's Hadnot Point numbers in determining the
6 level of exposure that Mr. Vidana would have been
7 exposed to when he went to Hadnot Point; fair?

8 A. That's correct.

9 Q. Other than the number of days and the
10 level of exposure from Mr. Maslia's report, is there
11 anything else, any other data inputs that both you
12 and Dr. Reynolds relied on that you reviewed to
13 ensure that you agreed with?

14 MS. GJONAJ: Object to form.

15 THE WITNESS: You know, I don't recall all
16 the specifics of her report. So I would have to
17 review her report in its entirety if you want me
18 to answer that question.

19 BY MS. HORAN:

20 Q. Okay. And you did not feel the need to
21 use the total microgram numbers that Dr. Reynolds
22 concluded in her report? You didn't feel the need to
23 include those in your report, correct?

24 A. Well, so -- you know, that's her
25 specialty. Just like she didn't include any of the

1 details about diffuse large B-cell lymphoma and
2 histologic subtypes in her report. So I knew that
3 she had a report where she was addressing that.

4 The overall number in May and June of '83,
5 of what was the actual concentration in the water at
6 that time, was similar. But I was, again, relying on
7 her report, but also found the data that she used to
8 develop those calculations was the same -- from the
9 same source of the data that I used.

10 Q. Okay. Did you use the total micrograms in
11 forming your opinion that Mr. Vidana's non-Hodgkin's
12 lymphoma was, at least as likely as not, caused by
13 the water at Camp Lejeune?

14 MS. GJONAJ: Object to form.

15 THE WITNESS: I don't really know how to
16 answer, did I use it? It's consistent with my
17 opinion, but it's not really something that I
18 used, in real time, to say whether or not my
19 opinions were what they were.

20 Regardless of those calculations, my
21 opinions would have been the same. Are those
22 calculations consistent with my opinion? Yes.
23 But I wouldn't say that I used them in any
24 objective sense to push me over the edge in
25 forming the opinion that, at least as likely as

1 not, his exposure was related to his diffuse
2 large B-cell lymphoma.

3 BY MS. HORAN:

4 Q. Where -- where on Camp Lejeune, to the
5 best of your understanding, did Mr. Vidana live?

6 A. I thought I already testified to that.
7 It's Camp Johnson.

8 Q. And is it also your understanding that
9 Mr. Vidana worked on Camp Johnson?

10 A. Well, I guess it depends on what you
11 describe as "work." But my -- my impression is that
12 Monday through Friday, he was predominantly at Camp
13 Johnson. But he testified that in the evenings and
14 on the weekends, that he traveled all over the base.

15 Q. And the numbers that you've included on
16 page 6, that we -- it's in the second-to-last
17 sentence. It reads: "During the period of time when
18 Mr. Vidana was at Camp Lejeune, the concentrations in
19 finished water ranged from 449 to 546 micrograms per
20 liter for TCE, 22 to 27 micrograms per liter for PCE,
21 7 to 8 micrograms per liter for benzene, and
22 36 to 45 micrograms per liter for vinyl chloride."
23 Did I read that correctly?

24 A. Yes.

25 Q. And those are numbers for contaminant

1 levels at Hadnot Point, correct?

2 A. Correct.

3 Q. How did you determine that Mr. Vidana was
4 exposed to water at Hadnot Point?

5 A. From his deposition testimony. That was
6 my -- you know, before I read his deposition
7 testimony, I did some, you know, research, and asked
8 questions with respect to the different aspects of
9 the base. And there was a lot of detail in the
10 ATSDR. And just looking into where Camp Johnson was
11 in relationship to the other water supplies of Tarawa
12 Terrace and Holcomb Boulevard and Hadnot Point, and,
13 you know, reading about -- when I read about, in the
14 deposition transcript, where they talked about -- he
15 mentioned about Main -- Mainside, I think, and what
16 that referred to, and he went to bars and
17 restaurants, and where would those be.

18 And so it came from a lot of independent
19 kind of research in asking the question, "Okay, what
20 does this mean, and where would this have been?" And
21 then looking into it in that respect. Because
22 otherwise I would not have known the significance of
23 just independently being told -- Hadnot Point versus
24 Tarawa Terrace is not something that I would have
25 known, so I had to do a lot of reading into -- you

1 know, a lot of that's spelled out in the ATSDR and in
2 other kind of references that I was able to find that
3 specifically talked about the different locations and
4 the wells in Camp Lejeune.

5 Q. How did the locations of the wells factor
6 into your opinion that Mr. Vidana went to Hadnot
7 Point?

8 A. I didn't say that they did.

9 Q. Oh, okay.
10 You mentioned that you asked questions.
11 Did you ask questions of individuals? Did you talk
12 to anyone about this? Or what did you mean by that?

13 A. No, I meant like asking myself the
14 question: What does this mean in his deposition
15 transcript? And then investigating the answer.

16 It's like hypothesis and theory. Like,
17 okay, I'm going to -- hypothesis is you're asking the
18 question, you know, "Does this cause this?" That's
19 what I mean, like ask the question in that respect.

20 Q. Understood.

21 A. Not an individual a question.

22 Q. Understood.

23 And you said you did research to answer
24 those questions through the ATSDR? Is that fair?

25 A. That's -- like I said, that's one of the

1 references that I looked at. But I also reviewed
2 other -- you know, there were also, in other
3 publications, I think, mentions of -- you know,
4 Hadnot Point was where the barracks were, and this
5 was, and this was, and, you know, all the
6 restaurants.

7 And they were -- over the course of
8 reading everything, all of my references of things
9 that are in my "Materials Considered," there's bits
10 and pieces in all of -- in many of those, I should
11 say -- that helped form my opinion about the actual
12 daily life of a marine in the '70s and '80s in
13 Camp Lejeune and what was really in the individual
14 areas.

15 Q. Beyond generally -- and I'm happy to flip
16 to your "Materials Considered" list if that would be
17 helpful -- but is there any -- with any more
18 specificity, can you point me to what publications
19 you looked at to determine, you know, that Hadnot
20 Point had restaurants, and a number of other things
21 that you're -- you've just referenced?

22 A. I think most of them, as I said, were in
23 the ATSDR. And, you know, just trying to Google
24 about Camp Lejeune and different locations, that was
25 my understanding, from my evaluation of what I could

1 find online and in the ATSDR regarding the different
2 locations where -- Tarawa Terrace is more like
3 families, and Hadnot Point had the vast majority of
4 the restaurants, which people called Mainside, and
5 they had bars and barracks, et cetera.

6 So that was -- that was my understanding
7 from -- just from the course of -- of reviewing all
8 of the literature in coming up with my report. But I
9 can't -- but I've already -- I've already told you
10 multiple times, majority, I think, was in the ATSDR.
11 And then obviously the -- probably some of the
12 Camp Lejeune-specific references, you know, might
13 have mentioned something in bits and pieces, not
14 anything with any additional significant detail
15 that's not in the ATSDR.

16 Q. And the ATSDR, you're referring to the
17 reports cited in your report and on the "Materials
18 Considered" list?

19 A. Correct.

20 Q. Okay. You mentioned Mainside.

21 MS. HORAN: Is it -- I want to share my
22 screen. Let me pull this into the chat for you,
23 Diana.

24 I'm marking as Exhibit 5 -- this is
25 Mr. Vidana's deposition transcript.

1 (Exhibit 5 was marked for identification.)

2 BY MS. HORAN:

3 Q. I believe you testified that Mr. Vidana
4 referenced Mainside, and I just wanted to understand
5 what testimony you were referring to. I'm going to
6 turn to page -- do you see page 100?

7 Would it be helpful if I zoom in?

8 A. Yeah, I can't -- I don't -- can't see
9 that. I'm not a crow. I can't see that small.

10 Q. It's also available in the chat, if -- if
11 that would be easier for you.

12 A. Okay.

13 Q. Okay. Can you read on page 100, lines 3
14 through 17? I don't need you to read them out loud,
15 just in your mind.

16 A. Okay. Yeah, I've read that.

17 Q. Okay. And so Mr. Vidana testified that he
18 did not know what "Mainside" meant; fair?

19 MS. GJONAJ: Objection.

20 THE WITNESS: That's correct, but it
21 was -- again, it was correlating with what -- he
22 didn't know what it meant, and he even talks
23 about later that, you know, many years ago, and
24 what they may call things now is different than
25 what they called things then.

1 And so he wasn't sure, but he went on to
2 elaborate that he went to bars and restaurants
3 and stuff, which would have correlated with what
4 is today known -- I guess today, or for the
5 purposes of this -- known as Mainside.

6 So yeah, if you want to just point out
7 those 14 or 15 lines that -- yeah, you don't
8 have the full context of, that when he went on
9 to describe where he was going and what he was
10 doing, that would correlate most likely with
11 Hadnot Point, which my understanding is what's
12 referred to as Mainside. That's the point.

13 BY MS. HORAN:

14 Q. Sure. And I'm trying to understand to
15 what limit you relied on Mr. Vidana for that, and to
16 what pieces your own analysis that you've taken
17 things Mr. Vidana said and then formed an opinion.

18 So is it your understanding that
19 Mr. Vidana testified that he went to Hadnot Point, or
20 that Mr. Vidana testified to information that based
21 on your questions and review that you did of the
22 ATSDR and other sources, lead you to believe that
23 Mr. Vidana went to Hadnot Point?

24 A. Yes. It's the latter. That -- based on
25 what he -- because he even said he didn't like know

1 what these things meant and that it was 40 years ago,
2 and, you know, he said that multiple times, that he
3 wasn't sure.

4 But he described his day-to-day life
5 during those seven weeks or whatever that he was
6 there, and based on what he described, it's my
7 opinion that during those times when he went to bars,
8 and when he would have been, you know, going to
9 restaurants, and, you know, in the car with, you
10 know, other friends that he became friendly with; but
11 those are the areas that, based on my understanding
12 of the life of those individuals that spent time at
13 Camp Lejeune, would have been at those times in what
14 we know as Hadnot Point, as far as where the
15 contaminated water would have been.

16 Q. You did not conclude that Mr. Vidana would
17 have been exposed to water at Tarawa Terrace,
18 correct?

19 A. No, I did not.

20 Q. And you did not conclude that Mr. Vidana
21 would have been exposed to water at Holcomb
22 Boulevard; fair?

23 A. That's correct. That's my understanding
24 from his deposition testimony.

25 Q. What is your understanding of the

1 frequency with which Mr. Vidana would have been
2 exposed to contaminated water at Camp Lejeune?
3 Excuse me. Let me rephrase that.

4 What is your understanding of the
5 frequency at which Mr. Vidana would have been exposed
6 to contaminated water at Hadnot Point?

7 A. So I would say, based on his testimony,
8 that it would have been between one and two days
9 every week, corresponding to the weekends, at least,
10 based on what he'd said and what he described.

11 Q. And how did you -- what facts did you rely
12 on in coming to that conclusion?

13 A. His deposition testimony with respect to
14 going to bars and eating in restaurants and when he
15 would do that. And it certainly could have been more
16 than that, but I think that that's probably a
17 minimum, because, you know, he talked about it
18 getting dark very quickly and getting cold very
19 quickly, like around 8:00 o'clock.

20 So -- and based on, you know, the distance
21 from Camp Johnson to Hadnot Point, it just seemed
22 like it was a -- a likely frequency of one to
23 two days a week over the course of that time that he
24 was there.

25 Q. And for the days that he went to Hadnot

1 Point, do you have any assessment of how much water
2 he would have been exposed to?

3 A. Well, I think it would depend. You know,
4 he described some of -- like not knowing where he'd
5 showered in different places, and would go to the
6 sink and drink gallons of water. It wasn't clear
7 whether some of those could have been Hadnot Point.
8 The way he described running all over the base, it
9 certainly could have been there.

10 So it's hard to say. I would say I would
11 generally use, you know, the average that was used
12 for the water modeling, which was, you know, by
13 Maslia. I think it was like, you know, a little over
14 at least a liter a day I thought sounded reasonable
15 if that -- maybe that might have been an
16 underestimate, given that's just only oral
17 consumption, and not taking into account inhalation
18 from showering, because he talked about being sweaty
19 a lot and needing to shower a lot, and some of those,
20 you know, sounds like they could have been at Hadnot
21 Point or, you know, those areas.

22 Dermal exposure through showering would
23 have been probably somewhat minimal in the grand
24 scheme of his exposure. Eating -- it didn't sound
25 like he went swimming anywhere in water that would

1 have been contaminated. So I would say it was at
2 least a liter, kind of similar to the average -- I
3 think they referred to it as CT, central tendency
4 exposure, I think, level.

5 So anyway, so that was kind of how I came
6 to that, based on water modeling that had been done.
7 I believe that that was also referenced in
8 Dr. Reynolds' report that I had reviewed, where she
9 did a couple different ones; an RME level, which
10 would have been like a maximum. And then for like,
11 you know, an active Marine that was in Hadnot Point
12 doing all of the training, et cetera.

13 And then the CTE, which would have been
14 kind of just a general civilian average risk or
15 average amount of water consumption which I would
16 imagine, based on his testimony, he would have been
17 closer to that, that CTE. So . . .

18 Q. So it's your assessment that he was
19 exposed to about 1 liter per day for the one to two
20 days per week that he was at Hadnot Point?

21 A. Probably a little more than that. And I
22 think even the -- I do remember one of the defense
23 experts even saying they felt like it was more than
24 what Dr. Reynolds had written in her report, which I
25 think -- we would have to pull up her report, but I

1 believe it was 1.2 liters per day was the estimate,
2 the average estimate for the CTE. And I think they
3 said that they would have even gone higher than that,
4 just based on inhalation from showering.

5 And again, I think, based on his
6 deposition testimony, it may have even been higher
7 than that, just based on the fact of him testifying
8 to drinking gallons of water, and maybe some of those
9 areas could have been at Hadnot Point. And it
10 wouldn't just have been at bars, when he was drinking
11 water, fluid, et cetera.

12 Q. You referenced the gallons of water that
13 he was drinking from. What is your basis that that
14 could have been from Hadnot Point? Is it just the
15 testimony of going to restaurants?

16 A. No. So he had said that he ran all over
17 the base, and that they would shower in different
18 areas. It didn't seem like it was -- based on his
19 testimony, it didn't seem like it was always at the
20 same area.

21 So -- and again, I'm not -- I'm not
22 assuming that it was more than that; but I'm saying I
23 can't exclude that he -- that's why I chose -- that's
24 why I'm saying it's -- I'm going with what
25 Dr. Reynolds evaluated as the CTE for him, and not

1 assuming that it's the higher level, although it
2 could be, based on his lack of being able to pinpoint
3 where he was showering and drinking outside the
4 showers when they would switch.

5 Q. Okay. So you did also rely on
6 Dr. Reynolds for determining the amount of water
7 per day that Mr. Vidana would have been exposed to
8 when he went to Hadnot Point?

9 MS. GJONAJ: Objection. Form.

10 THE WITNESS: Well, I think it was
11 consistent with Maslia's report. I thought that
12 those numbers were similar, which I found them
13 to all be similar.

14 BY MS. HORAN:

15 Q. Okay. And for your opinion, what number
16 did you rely on for the amount of water that
17 Mr. Vidana would have been exposed to when he went to
18 Hadnot Point?

19 MS. GJONAJ: Object to form.

20 THE WITNESS: Well, again, it would have
21 been in that range. It wasn't -- I didn't come
22 to a specific opinion that it's 1.5/8ths liters
23 per day. I was coming to the opinion that it
24 would be more in this range.

25 But again, it didn't -- that did not

1 affect the substance of my opinions, based on
2 all of the weight of the evidence with the
3 mechanistic studies that I've mentioned, the
4 genotoxicity of those substances that were in
5 the water, all of that taken into account, you
6 know, would be much more important than the --
7 the fraction of a couple liters that we're
8 talking about from 40 years ago.

9 BY MS. HORAN:

10 Q. I'm putting back on the screen -- let me
11 know when you can see it, Dr. Michaels.

12 A. I can see it.

13 Q. Okay. Great.

14 I'm going to turn to page 13, which is I
15 believe where you talk about the gallons and a couple
16 things you just referenced in your testimony.

17 A. Okay.

18 Q. I believe it's under -- on page 13, for
19 the record, in Section VIII, it says "Discussion Of
20 Vidana Case Facts." Do you see that?

21 A. Yes.

22 Q. Okay. "According" -- and the -- the
23 paragraph right below it. Do you see that piece?

24 A. Yes.

25 Q. Okay. The second sentence says, "During

1 his time at Camp Lejeune, Mr. Vidana testified that,
2 following running, he would shower and" -- in
3 quotations -- "'drink 5 gallons of water off the
4 sink.'" He noted that he 'couldn't drink enough
5 water' while at Camp Lejeune. He also testified that
6 he showered 'much more' than twice a day because he
7 was criticized for perspiring so much, approximately
8 3 to 5 times per day on weekdays, and 2 to 3 times on
9 weekends, sometimes for more than 15 to 20 minutes at
10 a time." Did I read that correctly?

11 A. Yes.

12 Q. And are these the facts you used in
13 assessing the amount of exposure that Mr. Vidana
14 might have had to Hadnot Point water?

15 MS. GJONAJ: Object to form.

16 THE WITNESS: Well, again, this is -- as
17 I've already testified to, you know, not all of
18 this would have occurred at Hadnot Point; much
19 of this would have likely been at Camp Johnson.

20 And so -- but that's what I've been
21 testifying to today, is the distinction about,
22 you know, how much of that would have been
23 likely at Hadnot Point, which I've already
24 mentioned that that's one of the, you know,
25 the -- one to two days on the -- per week would

1 be my assessment of how much of that, that I
2 elaborate on the first paragraph in
3 Section VIII, would have actually been at Hadnot
4 Point.

5 BY MS. HORAN:

6 Q. Sorry. You said you elaborate in the
7 first paragraph that -- of Section VIII on how much
8 of this would have been at Hadnot Point? Is that --
9 did I understand that correctly?

10 A. Yeah. Do you want to have the court
11 reporter read -- repeat my answer, if you missed it?

12 Q. Sure.

13 MS. HORAN: Karen, would you mind?

14 (Whereupon the Court Reporter read the
15 previous answer.)

16 BY MS. HORAN:

17 Q. Okay. You mentioned that you looked at
18 Mr. Vidana's deposition testimony, Mr. Maslia's
19 report, and Dr. Reynolds', to determine the amount of
20 water he would have been exposed to on those one to
21 two days per week that he was at Hadnot Point. Did
22 you use any other sources?

23 A. Not that I can think of.

24 Q. Did you do any assessment to determine
25 where the dining hall that Mr. Vidana would have used

1 was?

2 A. Well, my understanding was that the dining
3 hall that he used during the week was at Camp
4 Johnson, and that on the weekends is when he would go
5 to restaurants and bars, which I took as a
6 distinction from the dining hall. And most of those,
7 from my understanding and interpretation of what I
8 read, were at Hadnot Point.

9 Q. Turning back to Exhibit 1, page 13, the
10 second sentence, where you say that after running,
11 "he would shower and 'drink 5 gallons of water off
12 the sink.'" The shower and the 5 gallons of water
13 that he would drink off of the sink, those were both
14 at Camp Johnson, correct?

15 A. You know, it's not necessarily were always
16 there. It wasn't clear. I think most of it was
17 likely at Camp Johnson. But again, his uncertainty
18 in being -- in describing running all over the base
19 and showering in different facilities, it could have
20 been -- some of that could have been at Hadnot Point,
21 from my understanding of his deposition transcript.

22 Q. I'm putting on the screen Exhibit 5, which
23 is Mr. Vidana's deposition testimony. And I want to
24 make sure you can read this, so I'm going to ask you
25 to read -- you don't have to read it out loud, but

1 pages 114 and 115. And I'll just scroll whenever
2 you're -- you're ready.

3 A. Okay.

4 Okay. Okay, okay.

5 Q. So the testimony to drinking 5 gallons
6 from the sink, that took place in his barracks.
7 Correct?

8 A. Well, where's the part about him showering
9 on the weekends?

10 Q. So I can turn to -- well, so -- well,
11 let's -- let's turn to showering next. Let's just do
12 the drinking the 5 gallons off the sink.

13 A. No, no, that's not how it's going to work.
14 So -- and for me, that -- he is -- this is
15 one part of the context of his deposition. So he's
16 talking about -- here about showering, but it's
17 talking about showering Monday through Friday. From
18 my recollection, in his deposition testimony, he
19 talked about showering two to three times on the
20 weekends. And so I want to see where he talks about
21 the weekends, about it, because I didn't just make
22 that up. I got that from somewhere in his deposition
23 testimony.

24 So before I evaluate what he comments
25 here, I can't take one piece of his deposition

1 testimony and answer a broad question like that. So
2 I would be more comfortable, since I'm the only one
3 here that's under oath, to make sure my opinions are
4 accurate, looking at what I actually interpreted when
5 I read the entire deposition transcript and put in
6 Section VIII what you've already read.

7 Q. Sure. So if you turn to page 120. You
8 can read, obviously, as much as you'd like, and I'm
9 happy -- you can read all the testimony in between
10 the two, if you'd like.

11 A. Yeah. Can you go to page 119 first,
12 please?

13 Q. Sure.

14 MS. GJONAJ: Dr. Michaels, I think it's
15 the last -- she put it in the chat as well. So
16 if you'd prefer --

17 THE WITNESS: Okay. Yeah, let me just --
18 let me go to the chat. I'm more comfortable
19 with that than having you . . .

20 BY MS. HORAN:

21 Q. Yeah, absolutely. Dr. Michaels --

22 A. Yeah.

23 Q. -- time, I'm happy to -- happy to have you
24 scroll as you would like.

25 A. Sure. Thanks. Let me just go to this,

1 really quickly.

2 Okay.

3 Q. Okay. So I guess, now that you've had a
4 chance to review, what testimony were you referring
5 to when you mentioned that the showering on the
6 weekend may have happened at Hadnot Point?

7 A. Well, again, it's -- he talks about
8 running all over the base and showering. So it
9 wasn't clear to me, based on my understanding,
10 whether all the showering occurred at the same
11 location.

12 Q. Could you point me to where you're
13 referencing?

14 A. Well, let me find it.

15 So on page 101, so line 6, it says, "Where
16 else did you spend time?"

17 He said, "Again, it was 40 years ago. I
18 couldn't tell you exactly where it was. But I can
19 certainly tell that I've met some great Marines from
20 the unit from school, and we were all over the place
21 when we were not in the dining facility or if we were
22 not out running on our own. We were out exploring.
23 I have no idea where it was. I just wanted to get
24 away from the barracks."

25 So that, in combination with talking about

1 perspiring a lot, and, you know, right there, you
2 know, running on their own, if he was running on his
3 own, was away from that. It's not clear to me that
4 it was -- all the showering occurred necessarily in
5 one place, since there were shower facilities at
6 Hadnot Point.

7 And it wasn't clear to him, and it wasn't
8 clear, based on his testimony, my understanding of
9 the testimony, where exactly this occurred, if they
10 occurred at the same place every single time.

11 But again, again, to emphasize, this is
12 why I am using, for my assessment of his water
13 consumption, a more conservative level; but yet
14 qualifying that by saying if he happened to, you
15 know, be showering at other locations, it could have
16 been more.

17 And that's why I am using the assumption
18 that it's on the lesser end. But based on his
19 uncertainty, I'm adding the level of the certainty,
20 saying that if it was what he -- it's possible, based
21 on his unsure testimony of location, that it could
22 have been more; but even with that minimum exposure
23 level, assuming he never showered at Hadnot Point, my
24 opinion would be the same, and then amount of water
25 he was consuming would be the same as what I've

1 already testified to, approximately 1.2 liters, or
2 whatever that's listed as, you know, Maslia's report
3 and corroborated, essentially, by Dr. Reynolds, and,
4 you know, also approximately by the defense expert
5 who said that it probably was a little more than
6 that, than what Dr. Reynolds had -- had said, based
7 on inhalation.

8 Q. The 5 gallons that you referenced in your
9 report, you agree that Mr. Vidana's testimony was
10 that when he was talking about drinking 5 gallons
11 from the sink, he was talking about drinking in his
12 barracks, correct?

13 A. Can you repeat -- remind me what that was
14 on?

15 Q. Sure. Pages 114 to page 115. I can flip
16 to there.

17 A. Yeah, so -- so that was in -- in
18 conversation about Monday through Friday. But which
19 would -- he would be at his barracks, likely at Camp
20 Johnson.

21 But again, those same details were not
22 asked specifically when talking about the weekend.
23 So the absence of it, again -- and again, to
24 emphasize, that's why I'm using the, you know, CTE
25 number, the central tendency exposure level, and not

1 using the higher number, which was approximately
2 6 liters, I believe, a day.

3 All I'm qualifying is saying based on the
4 level of uncertainty in the deposition transcript,
5 that it could have been more, because it's not like
6 the questioner in his deposition said, "How much
7 water would you -- would you drink any water from the
8 sinks when you were showering on the weekend if you
9 were not in your typical location?"

10 It's not clear, based on the testimony.
11 That's all I'm testifying to now, is that my opinion
12 with respect to the minimum amount of water that he
13 would have consumed does not change; and all I'm
14 saying is that it could have been more than that, but
15 that's not a number that I'm relying on. I'm simply
16 trying to testify accurately with respect to how he
17 was deposed and the specific questions that he
18 answered.

19 Q. Understood.

20 Have you ever spoken with Mr. Vidana to
21 get any clarity on anything you were unclear about?

22 A. I have not.

23 Q. We've been going about an hour, and I
24 think I might be able to streamline this a bit.
25 Would -- would it be okay if we took a -- a 5- to

1 10-minute break?

2 A. Sure.

3 VIDEOGRAPHER: We're going to go off the
4 record at 2:59 p.m.

5 (A recess transpired from 2:59 p.m. until
6 3:09 p.m.)

7 VIDEOGRAPHER: We're back on the record at
8 3:09 p.m.

9 BY MS. HORAN:

10 Q. Dr. Michaels, I have on the screen your
11 report. Turn to page 5.

12 In the middle of the page, right before
13 Section VI, you talk about causes of diffuse large
14 B-cell lymphoma, which you also refer kind of --
15 throughout the report as "DLBCL." Is that fair?

16 A. Yes.

17 Q. And one of those studies you rely on is
18 the Cerhan study?

19 A. Okay.

20 Q. It's footnote 6 and 7. Do you see that?

21 A. Okay. Yes.

22 MS. HORAN: I'm marking as Exhibit 6 --
23 this is the Cerhan study that you relied on in
24 your report.

25 (Exhibit 6 was marked for identification.)

1 BY MS. HORAN:

2 Q. Correct?

3 MS. GJONAJ: It's also in the chat, if you
4 need to look at it there.

5 THE WITNESS: Oh, yeah -- yes, I -- yes, I
6 believe so. That's correct.

7 BY MS. HORAN:

8 Q. And for the record, this title -- this
9 study is entitled "Medical History, Lifestyle, Family
10 History, and Occupational Risk Factors for Diffuse
11 Large B-cell Lymphoma: The InterLymph Non-Hodgkin
12 Lymphoma Subtypes Project."

13 A. Yes.

14 Q. I'm going to zoom in so we can all read it
15 a little easier.

16 I'm going to read the first section -- or
17 first sentence of the results, but I'm not going to
18 read all of the parentheses, which includes the odds
19 ratios and the confidence intervals.

20 A. Okay.

21 Q. But the sentence reads: "DLBCL was
22 associated with B-cell activating autoimmune
23 diseases, hepatitis C virus seropositivity, family
24 history of non-Hodgkin lymphoma, higher young adult
25 body mass index, higher recreational sun exposure,

1 any atopic disorder, and higher socioeconomic
2 status." Do you see that sentence?

3 A. Yes.

4 Q. Okay. And I'm happy to flip back to your
5 report if it would be helpful. But I do not believe
6 you included in your report the risk factor of higher
7 young adult body mass index. Why did you not include
8 that in your report?

9 A. Well, because, you know, according to the
10 WHO obesity and non-Hodgkin's lymphoma, that data is
11 inconsistent, which is their terminology that they
12 use, I believe, in Volume 16, where weighting --
13 evaluating obesity as a carcinogen in the context of
14 non-Hodgkin's lymphoma.

15 So -- and what I was focusing on is not
16 overall risk factors; what I was focusing on are
17 known causal risk factors. I think a lot of people
18 would look at obesity, which, you know, the
19 association with risk in many malignancies with
20 obesity is somewhat well-defined in the setting of
21 hormonal responses.

22 So, for example, obesity is a causal risk
23 factor with breast cancer, endometrial cancer, other
24 hormone-related malignancies in the sense that the
25 adipocytes, which are what makes up the fat, have an

1 ability to peripherally convert circulating steroids
2 into hormonally active products like estrone. Those
3 can then promote a malignancy in the setting of a
4 hormone-dependent neoplasia.

5 We know that mechanism in the setting of
6 obesity. In the setting of nonhormone-associated
7 malignancies with obesity as a risk factor, the
8 reason a lot of the data is felt to be inconsistent
9 is that it has a -- a somewhat nebulous mechanism
10 that is not really well defined, and it's also
11 inconsistent.

12 Now, as I mentioned earlier, sometimes you
13 don't have to have the exact mechanism to know that a
14 particular carcinogen leads to a particular disease.
15 Before we understood the details of how cigarette
16 smoke led to lung cancer, we still knew that
17 cigarette smoke led to lung cancer, even before we
18 understood how.

19 So I'm not implying by any means that
20 because we don't understand how obesity may be a risk
21 factor for some nonhormonal-related diseases, that
22 it's not. But in that context, plus the added
23 context of the fact that it's inconsistent, the
24 epidemiology, and the fact that like this report
25 talks about young adult body mass; others talk about

1 older adult body mass; others say that it's one
2 versus the other; the others say that it's the other
3 versus the other. It's -- it's all over the map, as
4 the WHO, in the context of IARC, kind of elaborated
5 on Volume 16 of their monograph.

6 So that's why I didn't list anything else
7 with respect to higher socioeconomic status. I
8 didn't really know his socioeconomic status. Those
9 are all things that are more likely, you know, risk
10 factors in the setting of confounding than
11 necessarily a causal risk factor like a genotoxic
12 mutagenic volatile organic compound like TCE, PCE,
13 and benzene.

14 So that's what I really tried to focus on.
15 And, you know, not address -- although I -- I
16 acknowledged that he did have a history of obesity.
17 I believe he was technically obese at the time of his
18 diagnosis. I don't know what his body mass index was
19 when he was a young adult, because that certainly
20 doesn't qualify in his 40s.

21 Q. So you're relying on the WHO, Volume 16,
22 to rule out -- strike that.

23 You relied on WHO, Volume 16, when you
24 were assessing whether to include obesity as a -- as
25 a factor?

1 A. No. So --

2 MS. GJONAJ: Object to form.

3 THE WITNESS: Yeah.

4 So it's not the WHO; it's -- it's IARC,
5 which is part of the WHO, the World Health
6 Organization. And they have a monograph that
7 describes -- you know, the way they do it for --
8 they go through every single malignancy. And
9 they talk specifically about obesity and
10 non-Hodgkin's lymphoma, where they draw the
11 conclusion that the data is inconsistent.

12 And so I'm not -- that doesn't play into
13 account in my specific causation analysis,
14 because I -- it's not a causal risk factor, as
15 far as we've been able to delineate, whereas
16 exposure to carcinogens is a causal risk factor.
17 There's no risk of any sort of confounding
18 element -- like a lot of times, with respect to
19 obesity, which I've done a lot of independent
20 research on in the setting of malignancies, with
21 respect to obesity, a lot of what they have come
22 to the conclusion is, is there's not really a --
23 a specific biomechanism, necessarily, that we
24 know is at play with obesity and associated
25 malignancies, but it more be -- it more is the

1 fact that -- well, if you're obese, then you
2 also might have some insulin resistance, and
3 it's what's associated with insulin resistance
4 and the growth factors with insulin resistance
5 that would relate to any sort of neoplasia or
6 carcinogenesis, or the fact that if you're
7 obese, you're more likely than others to be
8 eating processed foods, or foods that are high
9 in saturated fats, and some of those chemicals
10 that are in the processed foods or the
11 high-saturated fats would be more likely in a --
12 as a confounding, to lead to whatever associated
13 malignancy may be in the literature.

14 But again, the IARC specifically concludes
15 with respect to non-Hodgkin's lymphoma that it's
16 an inconsistent finding. So -- and my
17 understanding of the weight of the evidence and
18 my opinion of the weight of the evidence for
19 non-Hodgkin's lymphoma, including diffuse large
20 B-cell lymphoma, with respect to the carcinogens
21 and the chemicals that I describe in my
22 report -- mainly benzene, TCE, and PCE -- is
23 that it's not inconsistent. They've actually
24 found that it is consistent; that there's
25 sufficient evidence -- which is actually, I

1 believe, the terminology that they use -- is
2 that there's sufficient evidence to say that
3 non-Hodgkin lymphoma is related to those.

4 BY MS. HORAN:

5 Q. And the "they" you used in the last
6 sentence was IARC? Who were you referencing when you
7 said "they"?

8 A. I believe it was -- I believe that it's
9 either IARC and -- and -- IARC and/or ATSDR. I'll
10 have to look and see. I remember specifically seeing
11 every malignancy separated -- I've reviewed so many
12 references, but I've seen every single malignancy or
13 group of malignancies separated out, where they went
14 through -- it must have been ATSDR -- where they
15 specifically said that it was sufficient for
16 causation for TCE and benzene, and suggestive of an
17 association or something -- some terminology like
18 that, for PCE.

19 I would have to go through my references
20 to find it, which I -- I could do, if you want me to
21 take that time to do it, to give you the exact
22 reference. But I know that that's what it said. And
23 that's also corroborated by findings in IARC.

24 Q. And then in terms of obesity, you're
25 saying the level of proof of causation is -- is

1 mixed, and there's not consistency across the studies
2 to show that it's a risk factor for NHL. Am I
3 understanding you correctly?

4 MS. GJONAJ: Objection.

5 THE WITNESS: You're understanding me and
6 IARC. The research is --

7 BY MS. HORAN:

8 Q. Okay.

9 A. -- the WHO. So yes, that's correct.
10 That's -- that's specifically what they are saying.

11 And as I elaborate, I've relied on the
12 World Health Organization and their publications as
13 one of the organizations that I rely on in forming my
14 opinions. And that opinion matches my understanding
15 from the literature which, before this litigation, I
16 -- have been something that I -- is something that I
17 have been interested in, and have actually lectured
18 on, with respect to obesity and obesity-associated
19 diseases.

20 Q. Okay. And you mentioned the WHO,
21 Volume 16, is one of the places that you would have
22 gotten that from?

23 A. It's -- it's IARC. And if you were to
24 look up IARC obesity, you know, monograph, Volume 16,
25 you would find it, I'm sure. That's what I remember.

1 Again, it wasn't something that -- my
2 opinion is -- again, I didn't go through every single
3 possible risk factor that has ever been listed in the
4 literature for diffuse large B-cell lymphoma and say,
5 "Well, this one is inconsistent; this one is
6 inconsistent."

7 I went through the ones that are
8 well-established known causal risk factors, and
9 systematically said he didn't have evidence of an
10 infection. He didn't have evidence of an autoimmune
11 disease. He didn't have a -- a known inherited
12 immunodeficiency. He didn't have an organ
13 transplant.

14 I went through those in detail and ruled
15 out ones that were actual causal risk factors.

16 Q. I'm marking as Exhibit 7 -- I just put it
17 in the chat, Dr. Michaels, if that's easier for you;
18 but I'll also put it on the screen.

19 MS. HORAN: I'm marking as Exhibit 7 --
20 this is a study by Marshall A. Lichtman, titled
21 "Obesity and the Risk for a Hematological
22 Malignancy: Leukemia, Lymphoma, or Myeloma."

23 (Exhibit 7 was marked for identification.)

24 BY MS. HORAN:

25 Q. Do you see that on your screen?

1 A. Yes.

2 Q. Are you familiar with this study?

3 I can zoom in.

4 A. I don't know if I've seen it before. This
5 was in 2010, so 15 years ago; is that correct?

6 Q. It is 2025, and it looks like it was
7 received and accepted and published in 2010; that's
8 correct.

9 A. Okay. Yes, I -- I see this 15-year-old
10 study.

11 Q. Does the fact that it's 15 years old
12 factor into your analysis of this study in some
13 particular manner?

14 A. 100 percent. And let me tell you why.

15 So this is a review. This isn't a study,
16 as best as I can tell. There's no materials or
17 methods. There's no results. This is a review of
18 the available literature from 15 years ago, that
19 would have been even before that, because it probably
20 took him several months to write it.

21 So when you're talking about risk factors
22 and causal risk factors, knowing the details of
23 molecular biology and evidence, that's something that
24 you need to review on an active, ongoing basis,
25 because the biology and our understanding of the

1 biology changes so frequently.

2 So this is something that I would
3 certainly -- I would not disregard on the face, but
4 it's one person's opinion. This is a review article.

5 So that, in the grand scheme of what I
6 would, you know, postulate on, would depend on what
7 Marshall Lichtman references. So there may be very
8 good articles as reference, but, you know, when
9 you're comparing what -- the WHO subset of the
10 International Agency for Research on Cancer, and
11 someone that is a professor at the University of
12 Rochester in New York, like -- if you're weighing the
13 evidence or the -- the weight of the opinion, I think
14 most people would generally go with the World Health
15 Organization consensus piece, where they reviewed all
16 of the literature and continually review all of the
17 literature.

18 But I'm happy to discuss whatever his
19 opinions are in this review article.

20 Q. So the first column under the "Abstract,"
21 do you see the sentence that begins "A significant
22 association"? It's four lines up from the bottom.

23 A. Yes.

24 Q. Okay. It reads: "A significant
25 association between the risk for non-Hodgkin's

1 lymphoma and elevated BMI was supported by a
2 meta-analysis of 13 cohort and 9 case-control
3 studies. The risk for diffuse large B-cell lymphoma
4 may be especially significant." Did I read that
5 correctly?

6 A. Yes, you read that correctly.

7 Q. You used a differential etiology or
8 differential diagnosis methodology to answer the
9 question of whether Mr. Vidana's exposure was at
10 least as likely as not a cause of Mr. Vidana's
11 diffuse large B-cell lymphoma. Is that fair?

12 A. Yes.

13 Q. And at a high level, could you -- or
14 whatever level of detail you think you need; I'm not
15 trying to limit you in any way -- describe the
16 methodology of differential diagnosis that you used
17 in this case?

18 MS. GJONAJ: Oh, I think we might have
19 lost Dr. Michaels.

20 THE WITNESS: Can you hear me?

21 MS. HORAN: Yeah, yeah, you're back.

22 MS. GJONAJ: It froze on my end for a
23 second. Could you just -- is there a -- could
24 you repeat the question?

25 MS. HORAN: Sure.

1 BY MS. HORAN:

2 Q. If you could describe what methodology or
3 differential etiology you applied in this case.

4 A. Okay. So it's what I do in my normal
5 practice when I'm evaluating a case, which is
6 evaluate, you know, a diagnosis or a potential
7 diagnosis. In this case it's -- it's slightly
8 different, where I'm evaluating the risk factors or
9 the causation of a known diagnosis.

10 But it would apply to what I do in my
11 normal practice when I do a clinical pathologic
12 correlation, in the sense that, you know, someone
13 comes in with a -- a particular type of symptom or a
14 finding on a CAT scan, and I then try to correlate
15 what could be the causes of that particular clinical
16 finding, and can I correlate that with the histology.

17 So in the case of like a lung mass or a
18 lung tumor, if I just see normal lung parenchyma with
19 a little bit of inflammation, that doesn't
20 necessarily correlate, but I have a differential
21 of -- this could be something inflammatory; it could
22 be something infectious; it could be something
23 neoplastic; it could be a foreign body; it could be
24 an autoimmune type of disease. And so you run
25 through this differential, where you go through and

1 you eliminate possible etiologies for this lung mass.

2 Now, in this case, what I'm doing -- which
3 is what I also do pathologically -- is I'm looking at
4 a particular disease and trying to rule out or rule
5 in causes, known causes, of that particular disease.

6 So I do this very frequently in the head
7 and neck, when you're dealing with oropharyngeal and
8 oral malignancies in particular, squamous cell
9 carcinoma, where just making the diagnosis of
10 invasive squamous cell carcinoma is not enough; I
11 need to say what caused it. Is this HPV-associated?
12 Is it associated with P53 mutation? Et cetera.

13 And so I then go through other steps,
14 where I review the clinical history and review any
15 sort of prior biopsies that had been done that may
16 have predisposed the patient to developing that
17 squamous cell carcinoma -- in the tongue, for
18 instance -- and then, to the limit that I can, do
19 additional studies to rule out or rule in the
20 etiologies for that malignancy.

21 In this case, I can't really do any
22 studies, and I can't review any other material to see
23 if there were areas -- doesn't really apply in this
24 case, because this was a nodal lymphoma in the sense
25 if this had been in the -- let's say in the -- in the

1 bone, then I would look at other aspects of the bone
2 to see if there was underlying chronic osteomyelitis,
3 or maybe he was in battle and had shrapnel there and
4 his chronic foreign body response led to it; but what
5 I'm doing is reviewing what the known, established
6 causation risk factors are for a non-Hodgkin's
7 lymphoma -- in particular, diffuse large B-cell
8 lymphoma -- and seeing if I can then rule out those,
9 based on either his presentation, the location of the
10 diagnostic material, or his clinical history.

11 And so that's basically what I did,
12 utilizing his treating oncologist's testimony about
13 testing she had done to do the same thing, with
14 respect to making sure it's not HIV-associated; it's
15 not EBV-associated; he wouldn't have any features
16 that suggested it could be a hereditary mutation that
17 would have predisposed to him having a diffuse large
18 B-cell lymphoma, which then would have further
19 prompted additional testing to make sure he doesn't
20 develop one of the other malignancies that those
21 germline mutations tend to predispose you to.

22 So it's that kind of very detailed long
23 process that I do in my normal practice, that I did
24 here, with this particular case.

25 Q. And I take it you did not consider

1 Mr. Vidana's weight, because you don't believe that
2 obesity could be a risk factor for non-Hodgkin's
3 lymphoma, so that would not have played into your
4 differential diagnosis here? Is that fair?

5 MS. GJONAJ: Objection. Form.

6 THE WITNESS: Not -- that's not fair. No,
7 I -- I did list his obesity. But again, it's my
8 opinion that his obesity, based on the weight of
9 the evidence, is not enough to support that
10 it -- that another cause was at play in the
11 development of his malignancy.

12 Again, because TCE, benzene, PCE, have
13 very known biological plausibility with respect
14 to genotoxicity, immune dysregulation, reactive
15 oxygen, oxygen species and their effects on the
16 DNA, immune suppression.

17 And in fact, in that -- with respect to
18 obesity, which you just mentioned, if you wanted
19 to talk about that review article from 2010, I
20 believe that author specifically talked about
21 biological plausibility, saying that it was not
22 present for obesity like it is present for these
23 carcinogens which is what I was testifying to
24 earlier, that there really isn't a well-known
25 biological plausibility for lymphomas.

1 BY MS. HORAN:

2 Q. Okay. So you did consider his obesity in
3 your differential diagnosis?

4 A. I considered every aspect of his clinical
5 history, including his other -- you know, there were
6 other aspects of his clinical history; you know,
7 sinus infections. Yeah, this was a head and neck
8 malignancy. So can certain infections give rise to a
9 subsequent lymphoma? Absolutely.

10 So I listed his sinus infection, but in my
11 opinion, a sinus infection, or presenting with sinus
12 infection, has no known -- like well-described
13 associated risk with diffuse large B-cell lymphoma.
14 But I didn't go in and present all of the data about
15 sinus infections and subsequent malignancies because
16 it's known that chronic inflammation can eventually
17 lead to a malignancy.

18 But that's not generally seen with sinus
19 infections, but I'm sure we could find articles that
20 talks about -- and we do know there's a subcategory
21 in the WHO for diffuse large B-cell associated with
22 chronic inflammation.

23 And so there were lots of things -- he had
24 a history of hypertension. You know, sinus
25 infections. You know, prior eye surgery. He smoked

1 five cigarettes, I think, or something like that, a
2 day since he was in his mid 20s, I believe.

3 So there were all these other things that
4 I did not specifically go through and say, "Well,
5 smoking is generally not considered" -- although
6 some -- I'm sure you can find some reports where
7 smoking is associated with a non-Hodgkin's lymphoma.
8 But smoking five cigarettes a day would not, in my
9 opinion, be sufficient to be a cause for a lymphoma
10 especially when we don't generally consider, as the
11 weight of the evidence, the overall body of the
12 literature, that smoking is associated with
13 non-Hodgkin's lymphoma.

14 So again, there's all these things that
15 you do as a physician in the setting of doing a
16 differential diagnosis or a differential etiology in
17 this case, that you don't spell out everything as I'm
18 doing it.

19 So that's all I'm saying, is that just
20 because -- like I clearly -- if I had not listed that
21 he was obese, and you said, "Dr. Michaels, did you
22 know that he was obese," and I would say, "Well, no,
23 I didn't."

24 So -- "Well, did you consider his
25 obesity?" Well, I couldn't have considered it if I

1 didn't know about it. But at the same time, it may
2 not have influenced my decision. But I wouldn't be
3 able to testify to that if I didn't know about that
4 going in.

5 Here I'm documenting that I know that he's
6 obese, and I still come to my same conclusions and
7 opinions that his exposure to TCE, benzene, and PCE
8 were at least as likely as not a cause of his diffuse
9 large B-cell lymphoma.

10 Again, I'm not saying they are the only
11 cause, or that they are the primary cause; but they
12 are, at least as likely as not, a cause. And in my
13 opinion, based on the lack of biological plausibility
14 data for obesity, that would not be anything that
15 would sway me away from my original opinion that I
16 come to, both within the body of my report and in the
17 summary of my opinions.

18 Q. So you're not offering the opinion that
19 Mr. Vidana's exposure to water at Camp Lejeune and
20 the TCE, PCE, and benzene were the primary cause of
21 Mr. Vidana's non-Hodgkin's lymphoma?

22 MS. GJONAJ: Objection to form.

23 THE WITNESS: Well, I was not asked to
24 evaluate that. Again, I'm going based on the
25 legal standard that I said that I reviewed in

1 conjunction with initially working on this,
2 which was at least as likely as not.

3 And so I evaluated the literature and
4 everything in that context. I did not evaluate
5 the literature, in this specific causation case,
6 for anything other than that.

7 BY MS. HORAN:

8 Q. I want to turn back to your report,
9 page 14. Let me know when you can see it.

10 A. Okay.

11 Q. I think this is just the -- the text of
12 what -- what we just talked about. But the
13 sentence -- you see it begins "In coming to my
14 conclusions"?

15 A. Yes.

16 Q. Okay. And that sentence reads: "In
17 coming to my conclusions in this report, I used a
18 differential etiology process applied to the question
19 whether his exposure to the chemicals in the water at
20 Camp Lejeune is 'as likely as not' a cause of
21 Mr. Vidana's DLBCL." Did I read that sentence
22 correctly?

23 A. No.

24 Q. What did I get wrong?

25 A. You missed "at least." You just said "as

1 likely as not."

2 Q. Oh. That's an important correction. Let
3 me -- let me fix that and read it again, and we'll
4 make sure I get it right this time.

5 " In coming to my conclusions in this
6 report, I used a differential etiology process
7 applied to the question whether his exposure to the
8 chemicals in the water at Camp Lejeune is 'at least
9 as likely as not' a cause of Mr. Vidana's DLBCL."
10 Did I read that correctly this time?

11 A. Yes.

12 Q. Thank you, Dr. Michaels.

13 So your opinion is, you say, "a cause" of
14 Mr. Vidana's DLBCL, as opposed to saying it's "the
15 cause" or "the primary cause." Is that the
16 distinction that we were just discussing?

17 A. Yes.

18 Q. Okay. I'm on page 5 of your report. The
19 second full paragraph begins: "Although the etiology
20 of diffuse large B-cell lymphoma (DLBCL)-NOS is
21 unknown in the majority of cases" -- do you see that?

22 A. Yes.

23 Q. Okay. How do you factor in the majority
24 of cases of DLBCL have an unknown cause, when doing a
25 differential diagnosis, to come to an individual's

1 determination of -- of what could have caused their
2 NHL?

3 A. Well, so that's based on, you know, I
4 guess a synonymous term would be "idiopathic." And
5 by definition, some things -- it's idiopathic does
6 not -- is not associated with unknown cause.

7 So now the majority, I think this is --
8 you know, basically this is stated by the WHO,
9 Classification of Hematopoietic Tumors, the most
10 recent one in 2000- -- yeah, as of now 2025, the
11 Fifth Edition, but it came out I believe a year or
12 two ago -- that's based on, in general, evaluation of
13 a patient's clinical history.

14 Because, you know, we have to acknowledge
15 and accept that we're dealing with a -- a
16 circumstance where we have known documentation of
17 carcinogens that are at a very high objective level
18 in water that was consumed by individuals where we
19 know they were living for various periods of time.

20 And so when you have something like that,
21 data like that, it by definition is no longer
22 idiopathic, when you can establish -- or it's your
23 opinion that those chemicals, in and of themselves,
24 can lead to the disease that a person has come down
25 with.

1 So although in the vast majority -- or I
2 wouldn't say "vast majority"; but in the majority of
3 cases of an NOS, not otherwise specified diffuse
4 large B-cell lymphoma, that you're dealing with in a
5 clinical setting, where you don't have clinicians
6 that have dug deep into the prior exposure history;
7 they didn't go to their house and test their well,
8 all these patients that are living off the grid, or
9 they haven't asked them specifically about every
10 single environmental exposure or occupational
11 exposure that they had in the last 30 years.

12 They're just going based on what they have
13 at the time. They would have no other way of
14 knowing, until you do that deeper dive, which
15 sometimes is available, depending on the clinician,
16 or depending on the circumstance in the medical
17 records, and the occupational history that's
18 available, you're really limited on when you can call
19 something unknown.

20 For example, when I was going through
21 medical school, it was well known that there was this
22 Rule of Tens with a type of tumor called a
23 pheochromocytoma. 10 percent are bilateral;
24 10 percent are in children; 10 percent are malignant;
25 and 10 percent were known to be familial. But --

1 that was back in the '90s.

2 But now, as we have -- as time has
3 progressed and molecular biology has progressed,
4 that's no longer applicable. This Rule of Tens is no
5 longer applicable, because it's now known that
6 that -- what we thought was 10 percent of times that
7 it was inherited, it's actually closer to 50 percent
8 of times.

9 Nothing changed with that tumor. Our
10 understanding has changed. As you have more
11 information, as you have more of an understanding of
12 the literature, as time goes on, the number of
13 unknown or idiopathic cases of anything is
14 decreasing.

15 We used to think that hereditary tumors in
16 the breast were just related to the BRCA1 and 2. We
17 only knew that that was the only -- that was 20 years
18 ago -- that was the only known genetic mutation that
19 predisposed you to breast cancer. Now there's over a
20 dozen that are tested for, because our understanding
21 has advanced.

22 So the number of cases that are not
23 hereditary has actually gone down. And that's what
24 we see occurring in any of these tumors, including
25 non-Hodgkin's lymphoma, including diffuse large

1 B-cell lymphoma. The prior couple classifications of
2 the World Health Organization hardly had any subtypes
3 of diffuse large B-cell lymphoma.

4 In fact, in 2007, when this was diagnosed,
5 it was just called large B-cell lymphoma and now we
6 know there are like a dozen of subtypes of diffuse
7 large B-cell lymphoma. Many of them are specifically
8 categorized, based on the underlying etiology. That
9 was not something that we knew 20 years ago.

10 So this is definitely something that's an
11 evolving field, and it's evolving as we learn more
12 information. And one thing that we continue to learn
13 more information about is the mechanistic data for
14 how these carcinogens are actually causing the
15 mutations that lead to the malignancies including
16 diffuse large B-cell lymphoma, which is so dominated
17 by the underlying molecular alterations in BCL2, BCL6
18 gene rearrangements, et cetera.

19 Q. Turning back to page 14 of your report,
20 the second full paragraph, that begins "In coming" --
21 do you see that?

22 A. The third full paragraph?

23 Q. Sure. Sorry, I thought the first
24 paragraph went on to page 13. But the paragraph that
25 begins "In coming." Do you see that?

1 A. Sorry, sorry, you said page -- which page?

2 Q. 14.

3 A. Oh, I'm sorry. I was on -- I was on
4 another page.

5 Q. Oh.

6 A. Yes, yes, I see.

7 Q. Okay. That paragraph has a sentence that
8 begins "Here, as discussed above" -- do you see that?

9 A. I see "In coming to my conclusions." That
10 sentence?

11 Q. Yes. So that paragraph, five rows down,
12 in the middle, it begins with "Here"?

13 A. Yes.

14 Q. Okay. That sentence reads: "Here, as
15 discussed above, Mr. Vidana has only one generally
16 accepted risk factor for NHL -- exposure to water at
17 Camp Lejeune for sufficient time and at sufficient
18 concentrations to be a cause of his NHL. We know
19 that Mr. Vidana was exposed to the water at
20 Camp Lejeune for more than 30 days and based on his
21 testimony, that was an exposure consistent with the
22 ATSDR report and the congressional 30-day time
23 frame." Did I read that correctly?

24 A. Yes.

25 Q. You reference "sufficient time." Is that

1 the 30 days that has come up a couple of times today?
2 Or what is your opinion or what did you mean when you
3 put "sufficient time"?

4 A. Yeah, and that's -- again, just to
5 clarify, the 30-days is, you know, over the course
6 of -- you know, it's -- it's not that -- you know,
7 none of the -- the data has been done that when you
8 have a 30-day time period, or a two-month period,
9 that every single day of that period is a time when
10 you're being exposed, because there's always going to
11 be -- in any of these epidemiologic studies, when
12 they look at a period of time, you can never say how
13 much during that period of time someone was exposed
14 to. And so the 30-days doesn't mean on every single
15 one of those 30 days he was being exposed to water
16 with carcinogens. He was there for a period of
17 greater than 30 days.

18 So that's what I'm referencing, and that's
19 what my understanding of the referencing for the --
20 the limit of 30 days is with respect to, you know,
21 Bove and -- et cetera, Rosenfeld, when they talk
22 about 30 days. It's not the 30 consecutive days of
23 being exposed on every day. It's that he was there
24 for a period greater than 30 days.

25 Q. And I believe you testified that you

1 believe he was exposed one to two days per week,
2 based on his testimony. Correct?

3 A. That's correct.

4 Q. So he wasn't exposed for 30 days over his
5 time at Camp Lejeune?

6 A. Likely not, based on his time and his
7 testimony.

8 Q. You also say "at sufficient
9 concentrations." What are you referencing when you
10 say that?

11 A. So again, I'm using what has been found in
12 the observational studies in combination, again, with
13 the mechanistic data, with the known biological
14 plausibility of how these carcinogens affect tumor
15 cells and normal cells becoming tumor cells.

16 So knowing that, you know, some of the
17 epidemiologic studies list it at, you know,
18 X concentration -- like, for example, TCE and PCE at
19 5 parts per billion -- that those were sufficient --
20 those patients in those groups, with that minimum
21 exposure, were -- had an association with, you know,
22 non-Hodgkin's lymphoma.

23 So the fact that his exposure was well
24 beyond that, particularly for TCE, in combination --
25 interpreting that in combination with the known

1 underlying mechanism of how these compounds affect
2 the cellular processes is why I consider it
3 sufficient.

4 I specifically did not say that it was
5 a -- met a threshold, because you really can't define
6 that in this context, in something that's a known
7 carcinogen, where you would -- you would do a
8 particular randomized controlled trial and have
9 different levels of exposure that are known, and
10 therefore develop somewhat of a -- potentially
11 develop a somewhat of a threshold. You can't really
12 do that in this case.

13 But what helps in this case, and what is
14 so striking in this case, is the known genotoxicity
15 and immune dysregulation and immune suppression that
16 occurs with these volatile organic compounds that
17 would lead to a non-Hodgkin's lymphoma, in particular
18 a diffuse large B-cell lymphoma, in combination with
19 what we know and what we have of the epidemiology.

20 So that's how I'm using the word
21 "sufficient," is because based on the amount, in
22 combination with everything else, that that was
23 sufficient for being, at least as likely as not, a
24 cause for his diffuse large B-cell lymphoma.

25 Q. And the amount that he was exposed to is

1 the numbers that you got from Mr. Maslia's report in
2 consideration with the time frame in one to two days
3 per week that he was there, and the 1 liter he would
4 have had when he was at Hadnot Point?

5 MS. GJONAJ: Objection. Form.

6 THE WITNESS: Well, again, approximately
7 1 liter. Like I said, I believe it was a little
8 more. And as I said, the -- the Department of
9 Justice expert actually said it was likely even
10 more than that, and that Dr. Reynolds
11 underestimated it.

12 But again, based on that CTE level that
13 was listed -- I believe it was 1.2 or something,
14 as I've already testified to you a couple
15 times -- yes, based on all of that, in
16 combination with the -- all of the mechanistic
17 data and everything, that all is -- again, none
18 of these are in a vacuum. I don't interpret any
19 of these studies or any of these elements in a
20 vacuum.

21 You really can't do that to form any sort
22 of causation opinion when looking at any
23 particular case, unless there's something that's
24 clearly overwhelming, like it's an
25 HPV-associated malignancy and the person's

1 HPV-positive. You don't really need to know
2 anything else, other than it's HPV-positive.
3 You have evidence of HPV. This is a known
4 HPV-associated malignancy.

5 Those cases are easy. Other cases are
6 not, and take a lot of incorporation of a lot of
7 different science, a lot of different studies, a
8 lot of different mechanistic biological
9 plausibility data. It's not just as simple as
10 looking at a few things, or looking at how
11 much -- you know, whether he had 1.2 or
12 2.2 liters per day. It's kind of taking
13 everything into account.

14 Otherwise, I think you're more likely than
15 not, you know, not going to have an opinion that
16 you could really stand by, unless you really
17 look at everything in any particular case -- as
18 much as you have available to you, at least.

19 BY MS. HORAN:

20 Q. Would you consider the amount of exposure
21 to be an important factor in drawing your conclusion?

22 A. I would say it is a factor in drawing my
23 conclusion, along with all of the other factors.

24 Q. You also say that the exposure -- strike
25 that.

1 You also say -- and I read this -- that
2 that was an exposure consistent with the ATSDR report
3 and the congressional 30-day time frame. Is the
4 ATSDR report that you're referring to there the same
5 one that we've been talking about, the 2017
6 assessment of the evidence?

7 A. Yes, that's my understanding.

8 Q. And the congressional 30-day time frame,
9 what are you referencing there?

10 A. Well, we've already -- I thought we've
11 already talked about that. In the Camp Lejeune Act
12 of -- whatever it was, 2022 -- that the ATSDR
13 referenced in the beginning of -- or towards the
14 beginning of their publication.

15 Q. Do you rely on Congress's 30-day
16 assessment of the time frame to determine that
17 30 days of exposure is a -- a sufficient time frame?

18 MS. GJONAJ: Object to form.

19 THE WITNESS: No.

20 BY MS. HORAN:

21 Q. Sorry --

22 A. No. I would say it was -- I said -- I
23 said "no."

24 I was saying that it was consistent with
25 that. I didn't say that I relied on that, or that I

1 was only using that as a basis for my opinions. I'm
2 just simply saying it matches what they have listed
3 as a qualification for, I guess, evaluation in this
4 context.

5 Q. How much -- if you have an opinion, how
6 much did Mr. Vidana's exposure to water at Hadnot
7 Point increase his baseline risk of developing NHL?

8 MS. GJONAJ: Objection. Form.

9 THE WITNESS: Well, again, that's -- he
10 got -- he got a non-Hodgkin's lymphoma, so I
11 guess 100 percent in his case. I mean, there's
12 no way to -- I'm saying that with some humor,
13 because there's really no way to say how much it
14 increases risk when he actually developed it.

15 It would be more accurate to talk about --
16 to look at other data, and say how much does it
17 increase his risk of developing a pancreatic
18 cancer or a kidney cancer? One -- something
19 that he has not, as of yet, developed.

20 But there's really no way to go back,
21 retrospectively, and say how much of a risk it
22 increased, because he developed it. And it's
23 kind of something that -- again, that data -- we
24 don't really know the real answer, because of
25 the misclassification based on exposure limits

1 and -- well, based on the exposure groups, I
2 should say -- because we don't really know what
3 the true relative risk is.

4 And I don't think, for something like
5 this, you really can know with any, you know,
6 absolute certainty, how much a particular
7 carcinogen, that is a known carcinogen, where
8 a -- many randomized controlled trials haven't
9 been done, to say in any individual case what
10 one particular exposure increases someone's
11 risk.

12 For him, unfortunately, he developed and
13 was diagnosed with a diffuse large B-cell
14 lymphoma. And based on my evaluation of his
15 entire medical record that I had access to, and
16 knowing all of the subclassifications and
17 etiologies for causes of diffuse large B-cell
18 lymphoma, again, it's my opinion that regardless
19 of how much it increased his risk, that was a
20 cause of his diffuse large B-cell lymphoma.

21 BY MS. HORAN:

22 Q. You mentioned in your answer the
23 misclassification of exposure groups?

24 A. Right.

25 Q. Is that reference to the epidemiological

1 studies you were discussing earlier today, the
2 difficulty of determining exposure in those studies?
3 Or what were you referencing?

4 A. Right. So I believe that was in Bove,
5 where they talked about, you know, the
6 nondifferential exposure and misclassification, and
7 how it would have been more likely to bias the
8 results towards the null. So not representing a true
9 relative risk for any individual exposed to that,
10 based on the fact that some of the individuals that
11 were not exposed were included in the exposed group.

12 Q. Is it possible to determine the increased
13 risk of someone for developing non-Hodgkin's lymphoma
14 who was at Camp Lejeune for six or seven weeks, and
15 who was exposed to contaminated water at Hadnot Point
16 for one to two days a week of those six to
17 seven weeks, and was exposed to approximately 1.2
18 liters of contaminated water on those days?

19 MS. GJONAJ: Objection. Form.

20 THE WITNESS: So again, it's -- if
21 you're -- you're obviously repeating the
22 criteria for Mr. Vidana. And so, again, that's
23 kind of a -- a moot point, because he developed
24 diffuse large B-cell lymphoma.

25 Now, taking that away, and just looking

1 at -- at those particular risk factors, if
2 someone -- I think it's no question, based on
3 all of the data, that their risk would be
4 increased.

5 Now, if you want to say how much would it
6 be increased, I think that would be very
7 difficult to give an exact number, because of
8 all the limitations of the epidemiologic studies
9 which have been done with respect to this
10 location, being at Camp Lejeune, because of all
11 the other extenuating circumstances that --
12 weaknesses in the study that inhibit you from
13 being able to really know what a true relative
14 risk would exist for any individual person.

15 But that is not the issue at the -- at
16 case -- at the case here. The issue is, was his
17 level of exposure, at least as likely as not, a
18 cause for the development of a malignancy that
19 he did develop and was diagnosed with in 2007?
20 And again, that is my opinion, that it was.

21 And so the fact that you can't, you know,
22 exactly quantify what a risk would be, whether
23 it would be 1.15 or 1.89 or 2.7, for the people
24 that actually develop the malignancy, it doesn't
25 matter what their risk was. If it was elevated,

1 that means some of them get it. That means when
2 you take a million people, some of the million
3 people got it when they likely would not have
4 been diagnosed with that without that exposure.

5 So it doesn't really matter, when you're
6 talking about an individual that actually
7 developed the malignancy. Which, again, is what
8 we're talking about here, which, again, is why
9 MCLs don't really matter, and it doesn't
10 really -- in the context of, you know, talking
11 about a level of exposure, because those are
12 meant for -- to serve as a public health risk
13 assessment for people without disease. We're
14 talking about people that have disease.

15 So I think all of that is what you have to
16 take into account, knowing that you can't really
17 give a specific number as an elevated risk for
18 any individual prospectively, because it would
19 really depend on their own personal factors.

20 And you can't really think about any of
21 this and interpret any of this in a vacuum; it
22 all has to be taken with the weight of the
23 evidence to assess any individual's risk. Not
24 just one aspect or one exposure, and what would
25 that risk would be, because based on the studies

1 that we have, without being an unethical study,
2 which is how would you be able to come to that
3 conclusion or -- or develop those kinds of
4 numbers, you can't really do it otherwise.

5 But that doesn't preclude you from being
6 able to come to the conclusion, to a reasonable
7 degree of medical certainty, that a particular
8 exposure is a cause of a particular disease.

9 BY MS. HORAN:

10 Q. Is it your opinion that evidence that
11 exposure can cause an ailment, and evidence of the
12 exposure and the later development of that ailment,
13 proves causation?

14 MS. GJONAJ: Objection. Form.

15 THE WITNESS: Could you read that again?

16 BY MS. HORAN:

17 Q. Sure. Is it evidence that -- strike that.
18 Is it your opinion that evidence that
19 exposure to a particular contaminant can cause or are
20 associated with an ailment, and evidence that a
21 particular individual was exposed to those chemicals,
22 and then later developed that ailment, proves
23 causation?

24 MS. GJONAJ: Objection. Form.

25 THE WITNESS: Again, it -- not -- not

1 necessarily. It would depend on all of the
2 circumstances.

3 So again, to go back to smoking, to
4 emphasize this, in my expert witness work on the
5 defense side, would be that there are many
6 people who are smokers who develop a malignancy
7 that's known to be associated with smoking. But
8 based on either their amount of exposure, their
9 duration of exposure, or other particular
10 factors associated with the tumor biology, what
11 they were actually diagnosed with would not
12 necessarily prove or be indicative that that
13 exposure, being smoking, caused that generally
14 smoking-related malignancy.

15 Because you have to look at all of the
16 factors, which is what I did in this case. I
17 went into great detail, elaborating on all of
18 the factors, all of the known causal risk
19 factors, in coming to a -- to a conclusion based
20 on all of the data.

21 BY MS. HORAN:

22 Q. Had Mr. Vidana never gone to Camp Lejeune,
23 he still could have developed non-Hodgkin's lymphoma,
24 correct?

25 A. Anything's possible. Yeah, he could have

1 developed a non-Hodgkin's lymphoma. He could have --
2 that -- that doesn't -- you know, just because I go
3 out in a lightning storm and am struck by lightning
4 doesn't mean that the next lightning storm I go out
5 in, I'm going to be struck by lightning.

6 I mean, again, as I already elaborated on,
7 there's nothing specific about diffuse large B-cell
8 lymphoma related to the carcinogens that are in the
9 water -- that were in the water at Camp Lejeune. So
10 there are people -- as I've gone through a variety of
11 times -- that are exposed to various other infections
12 and other things that can give rise to diffuse large
13 B-cell lymphoma.

14 But you don't associate a particular
15 disease as being idiopathic -- which is what you're
16 insinuating, based on that question -- if you
17 actually have a known cause.

18 Q. Sure. And if Mr. Vidana hadn't gone to
19 Camp Lejeune and he still developed non-Hodgkin's
20 lymphoma, you would have included him in the vast
21 majority of NHL cases where there is no known cause?

22 A. Yeah. Again, it would depend on the
23 particular circumstances. Because now you're using a
24 hypothetical, because he did go to Camp Lejeune. But
25 it would depend on the other circumstances. So

1 again, it would depend on the particular case.

2 But if everything else was the same in
3 this case, then I would not have a -- a cause where I
4 would be able to say, you know, if he had not gone to
5 Camp Lejeune, I would not have what is a known cause
6 that is, at least as likely as not, associated with
7 diffuse large B-cell lymphoma.

8 But that's not the case with Mr. Vidana.

9 Q. We've been going about an hour. Do you
10 mind if we just take a ten-minute break?

11 A. Sure.

12 VIDEOGRAPHER: All right. We're going to
13 go off the record. 4:11 p.m.

14 (A recess transpired from 4:11 p.m. until
15 4:19 p.m.)

16 VIDEOGRAPHER: Back on the record at
17 4:19 p.m.

18 BY MS. HORAN:

19 Q. I'm putting back on the screen your
20 report, Dr. Michaels, which is marked as Exhibit 1.

21 Do you see Section VII is on -- or the
22 beginning of Section VII is on the screen?

23 A. Yes.

24 Q. Okay. In doing your literature search in
25 forming your opinions, did you, to the best of your

1 knowledge, add any new studies that were not included
2 in the general causation expert reports that you
3 reviewed?

4 A. I -- I did not go line by line and look at
5 what they included to know that if I cited studies
6 that they did not include. I didn't feel that
7 would -- would be a good use of my time.

8 Q. Turning to page 8, do you see the
9 Section B that starts with "Trichloroethylene"?

10 A. Yes.

11 Q. When assessing the amount of exposure in
12 the situation that Mr. Vidana was in with
13 Camp Lejeune, which of these studies that you cite to
14 in your report did you find most informative?

15 MS. GJONAJ: Objection. Form.

16 THE WITNESS: Well, I didn't really think
17 about it as what study is most informative.
18 I kind of look at all of the studies, and they
19 all may inform different aspects of my opinion,
20 because my opinion isn't one unilateral, you
21 know, opinion that is based on one particular
22 study, or the weight is based on one, et cetera,
23 although you definitely go through individual
24 studies and weigh them, the evidence stronger
25 than others.

1 When forming an overall opinion, I don't
2 then keep a sheet of which study, in a
3 hierarchical order, I weighed higher than the
4 others. If I cited it and included it, then I
5 incorporated those findings into my overall
6 opinion.

7 BY MS. HORAN:

8 Q. Did you find any of the studies that you
9 cite to in your section on TCE, did you find any of
10 those had a similar exposure pattern as that of
11 Mr. Vidana?

12 A. I would have to open up every single one
13 of those references and specifically go back with
14 that question in mind. I don't specifically, as I
15 sit here, recall any exact exposure pattern.

16 But you don't typically see that when
17 trying to correlate any individual patient with any
18 individual study. That's why, in medicine, we
19 extrapolate based on overall findings in the medical
20 literature to a particular patient, and -- and make
21 assumptions or extrapolations based on what we have
22 in the medical literature, and the particular case,
23 and how it applies to any individual patient.

24 So I didn't really go looking to see if
25 someone had that degree of exposure, but I also know

1 that a lot of the other exposure cases and exposure
2 studies didn't have the degree, for example, of TCE
3 in the water that was seen at Hadnot Point in
4 Camp Lejeune.

5 So it would be hard to go apples for
6 apples and compare any particular study, because
7 maybe there were some studies where individuals were
8 exposed for three months instead of six weeks, but
9 that the micrograms per liter were 50 as opposed
10 to 500, for example.

11 So you kind of have to look at everything
12 in the context of the research, and extrapolate based
13 on the available data that you have.

14 Q. Sure. So you, as part of your methodology
15 in forming your expert opinion, did not take
16 Mr. Vidana's exposure assessment that you made and
17 compare it to the epidemiological studies to
18 determine if -- if one particular or a couple
19 particular applied, based on the similar exposure
20 patterns?

21 MS. GJONAJ: Objection. Form.

22 THE WITNESS: That's not at all what I
23 said. I said I did not specifically note that
24 any of them had the exact exposure pattern, but
25 that based on the results in those studies, and

1 that -- the exposure pattern that was there, I
2 then extrapolate and apply those findings and
3 those durations and levels of exposure to
4 whatever particular case I'm looking at; in this
5 case, Mr. Vidana.

6 So I'm not saying that I did not take into
7 account his exposure level, because of course I
8 did. And I mentioned that in my report, that --
9 and we already -- you already read on the
10 record, in the conclusion, me talking about
11 sufficient level of exposure for a sufficient
12 duration. We already discussed that.

13 So of course I did that, but what I'm
14 saying is I was not specifically only evaluating
15 a study to find studies that had the exact
16 exposure pattern that Mr. Vidana had. That's
17 all I'm saying.

18 BY MS. HORAN:

19 Q. On your report, on page 8, do you see the
20 citation -- it's footnote 27 -- to Hardell. And then
21 the associated sentence is nine lines into the last
22 paragraph.

23 A. Yes.

24 Q. Okay. And that sentence reads: "A study
25 of histologically confirmed non-Hodgkin lymphoma

1 cases in Swedish workers exposed to various solvents,
2 found markedly increased risk with exposure to TCE
3 (RR equals 7.2; 95 percent CI, 1.3 to 42), in which
4 even relatively short-term exposures under 30 days
5 (1 to 17 days) were associated with an elevated risk
6 for non-Hodgkin lymphoma (RR equals 6.5; 95 percent
7 confidence interval, 2.1 to 18)."

8 You see that sentence?

9 A. Yes.

10 Q. Okay. And the citation and support for
11 that is the Hardell study?

12 A. Yes.

13 Q. And I've put that in the chat. Let me
14 share it on the screen, though.

15 A. Okay.

16 (Exhibit 8 was marked for identification.)

17 MS. HORAN: I'm marking as Exhibit 8 --
18 this is a study from 1994, by -- lead author is
19 Leonard Hardell, and it's titled "Exposure to
20 Phenoxyacetic Acids, Chlorophenols, or Organic
21 Solvents in Relation to Histopathology, Stage,
22 and Anatomical Localization of Non-Hodgkin's
23 lymphoma."

24 BY MS. HORAN:

25 Q. Is this the study that you relied on,

1 Dr. Michaels?

2 A. Yes.

3 Q. I'm going to turn to the bottom of page 2.
4 Are you looking at the screen, or do you
5 have it up on your computer?

6 A. Both.

7 Q. Okay. If you look at the bottom of
8 page 2, do you see "Pheno" -- the section on
9 "Pheno" -- Y-X-A-C-E-T-I-C -- how do you say that
10 word, Dr. Michaels?

11 A. Phenoxyacetic.

12 Q. Phenoxyacetic? Okay.

13 A. Yeah.

14 Q. Okay. TCE is not a phenoxyacetic acid,
15 correct?

16 A. Correct.

17 Q. Okay. Turning higher, to the top on
18 page 2, the column on the right --

19 A. Okay.

20 Q. -- is about the -- the -- I guess from the
21 first page to the second page, do you see it's
22 bolded, "Phenoxyacetic Acids"?

23 A. Say that again?

24 Q. Sure. From the bottom of the first page
25 to the top of the second page, there's a paragraph

1 that's -- the first two words, bolded, are the
2 "Phenoxyacetic Acids." Do you see that?

3 A. Uh-huh.

4 Q. All right. And the last -- it's the first
5 full sentence on page 2. It reads "Exposures of
6 1 to 17 days yielded OR equals 6.5 (2.1 to 18)"? Do
7 you see that?

8 A. Yes. Yeah.

9 Q. I -- I wasn't able to find it. If you
10 could point me to where it is, or if it's this, the
11 "6.5" and then "2.1 to 18" is in your report, related
12 to TCE. Is -- are those numbers related to TCE, or
13 was there someone else -- somewhere else in this
14 study that -- that has those numbers?

15 A. I'm reviewing it.

16 So it looks like that's a typo, because
17 that is not associated with trichloroethylene. In
18 fact -- yeah, the 7.2 is accurate, but that
19 short-term is not associated with trichloroethylene,
20 in my rereview of this.

21 In fact, interestingly, there -- they
22 reference a -- an odds ratio of greater than -- or
23 odds ratio of 11 for exposure to degreasing agents,
24 including benzene and trichloroethylene, which again
25 would speak to that additive or synergistic effect

1 with two compounds that are both found in the water
2 in Camp Lejeune.

3 Q. And are you reading from page 2, the
4 paragraph, bolded, that starts with "Organic
5 Solvents"?

6 A. Yes.

7 Q. And that "OR" you're referencing is from
8 the sentence "Exposure to degreasing agents gave
9 OR 11 (2.9 to 72)"?

10 A. Right.

11 Q. Okay. And the "7.2" that you have in your
12 report, is that from Table 2?

13 A. Correct.

14 Q. Okay. And that's based on four cases?

15 A. That's correct. And that's the problem
16 with all of these studies with epidemiology, which is
17 why you have to include -- even though that is
18 markedly statistically significant, in this context,
19 with an odds ratio of 7.2, I mean, just objectively
20 speaking, that's a very high odds ratio.

21 Again, I -- you would never take this one
22 study alone. You would interpret it in the context
23 of all of the other studies and all of the other
24 mechanistic data with respect to how we know TCE
25 causes particular non-Hodgkin's lymphomas with their

1 genotoxicity and immunomodulation and
2 immunodeficiency and increased chronic inflammation
3 and, you know, increased interleukin 6 and TNF alpha,
4 et cetera. I mean, the list goes on and on for how
5 they cause their initiating events -- and promoting
6 effects, for that matter -- of a non-Hodgkin
7 lymphoma, including diffuse large B-cell lymphoma.

8 But because, when you deal with further
9 subtypes of malignancies, you know, non-Hodgkin's
10 lymphoma is an uncommon malignancy in general. So
11 when you're trying to get any sort of statistics,
12 it's hard to go based on just epidemiology alone,
13 especially when you can't, for ethical reasons, do
14 randomized controlled trials. So you have to take
15 everything into account when evaluating the weight of
16 the evidence.

17 Q. Turning back to your report, which is
18 marked as Exhibit 1, and I turn to page 9. There's a
19 Section C on PCE.

20 The end -- the last sentence of the first
21 paragraph cites to a -- a study by Dr. Goodman. And
22 the sentence reads: "A relatively recent review
23 published in the literature by authors employed by
24 Gradient, a private environmental consulting firm
25 involved in litigation, purported to conduct a

1 systematic review of the literature regarding the
2 association between PCE and non-Hodgkin lymphoma and
3 concluded that the evidence did not support a link
4 between exposure and malignancy."

5 A couple of times today we've referenced
6 Dr. Goodman. Is this the study that you were
7 thinking of for Dr. Goodman?

8 A. I mean, that is -- that is -- Dr. Goodman
9 is the first author, but I -- I don't know if it's
10 "the study." I don't know if I've only seen her name
11 once. It sounds familiar.

12 Q. I believe that you referenced earlier that
13 the level of association between PCE and
14 non-Hodgkin's lymphoma, that the ATSDR concluded that
15 the association level was lower than the association
16 levels for -- strike that. Let me try again.

17 I believe you had mentioned earlier that
18 the ATSDR found that the level of evidence of an
19 association between exposure to PCE and the
20 development of non-Hodgkin's lymphoma was lower than
21 that -- lower for PCE than it is for TCE and benzene.

22 MS. GJONAJ: Objection. Form.

23 THE WITNESS: Are you going to ask a
24 question? You just --
25

1 BY MS. HORAN:

2 Q. Sure. Is that your understanding? I
3 think you testified that that was your understanding.

4 A. Is that a -- correct? Or -- I mean, are
5 you asking me, is that my understanding?

6 Q. So I want to make sure that -- I believe
7 you said that, and I'm going to ask you if you agree
8 with the ATSDR. But I want to make sure that I'm
9 understanding what you're -- what you believe it is,
10 I guess.

11 MS. GJONAJ: Object to the form again.
12 And if you're going to ask him about a specific
13 document, I think you should let him see the
14 document.

15 THE WITNESS: That's exactly what I was
16 going to ask, if we could pull up the document
17 and go to that portion.

18 BY MS. HORAN:

19 Q. Sure. Well, let's set the ATSDR aside,
20 then, for a minute.

21 A. Okay.

22 Q. Do you believe that the evidence of
23 association between a link between exposure to PCE
24 and the development of NHL is lower than, you know,
25 the weight of the evidence for TCE and benzene?

1 A. I would say, based on --

2 MS. GJONAJ: Objection to form.

3 THE WITNESS: I would say, based on the
4 overall literature, that in general, what's
5 reported and what's in the literature currently
6 appears to show that the risk associated with
7 TCE and benzene, and further associated
8 non-Hodgkin lymphoma, particularly diffuse large
9 B-cell lymphoma, is more robust than what's
10 available for PCE in the literature.

11 BY MS. HORAN:

12 Q. I've turned to page 11 of your report.
13 And looking at the top, it says, the first full
14 sentence: "A separate large Chinese study published
15 by the same group also found that workers with 10 or
16 more years of exposure to benzene had a significantly
17 increased risk of developing non-Hodgkin lymphoma (RR
18 equals 4.2; 95 percent CI equals 1.1 to 15.9.)"

19 And that cites to your footnote 44, which
20 is Hayes, 1997. Did I read that correctly?

21 A. Yes.

22 Q. I've put it in the chat, if that would be
23 helpful to you, but I'll also pull it up on the
24 screen.

25 MS. HORAN: I'm marking as Exhibit 9 --

1 this is a study -- "Benzene and the Dose-Related
2 Incidence of Hematologic neoplasms in China."

3 The lead author is Richard B. Hayes.

4 (Exhibit 9 was marked for identification.)

5 BY MS. HORAN:

6 Q. Dr. Michaels, is this the study that you
7 relied on in your report?

8 A. Yes.

9 Q. Turning to Table 2 -- let me zoom in a
10 little.

11 You cited in your report the -- the
12 numbers from Table 2 for greater than 10 years.
13 Correct?

14 A. Yes.

15 Q. And you would agree that for a duration of
16 5 to 9 years, the 95 percent confidence interval does
17 not show that there's a statistically significant
18 increase for risk of developing NHL?

19 A. Where are you talking about?

20 Q. Sure. So "NHL" is the second disease.
21 And then if you go over to the -- I'll say the third
22 column -- you see it says "Duration, years"?

23 A. Yes.

24 Q. Okay. And the -- of "Duration, years,"
25 there's three options. It's less than 5 years,

1 5 to 9 years, or greater than 10 years. Do you see
2 that?

3 A. Yes.

4 Q. Okay. And for greater than 10 years,
5 that's what you -- you put in your report. I think
6 you -- you said it in the report as well.

7 A. Yes.

8 MS. GJONAJ: Objection. Form.

9 BY MS. HORAN:

10 Q. And for 5 to 9 years, the RR is 3.3 and
11 the 95 percent confidence interval is .7 to 14.7. Do
12 you see that?

13 A. Yes.

14 Q. Okay. So for exposure for 5 to 9 years,
15 there's no statistically significant increased risk
16 of developing NHL, according to this study, correct?

17 MS. GJONAJ: Objection. Form.

18 THE WITNESS: So there's no -- the
19 statistical significance is not reached in that
20 number.

21 BY MS. HORAN:

22 Q. And the same is true for duration of
23 exposed to less than 5 years, correct?

24 A. That's correct.

25 Q. Why did you cite statistics for over

1 ten years when Mr. Vidana was here for less than --
2 or strike that.

3 Why did you cite to the statistics for
4 over ten years in your report when Mr. Vidana was
5 exposed for less than two months?

6 A. Well, again, in general, what you -- the
7 prior -- one of the prior articles that you put up,
8 you made a point, even though it was statistically
9 significant, of pointing out that there were only
10 four cases. What you're failing to do, for the
11 record in this case, is that the under 5-year
12 duration, there's only one case in that group.

13 So I find that kind of misleading, that
14 you're cherrypicking the information that you choose
15 to show, when you choose to show it, when it fits
16 your narrative.

17 So what I've done is I've gone through all
18 the literature. And with respect to under 5 years,
19 even if there had been one that had been -- if there
20 had been another patient in there that had, you know,
21 more cases than that, there weren't a total number of
22 a lot of cases in that study. And so it's hard to
23 base any sort of information based on a small number
24 of cases that are evaluated in this. So it's hard to
25 form any sort of opinion.

1 And when you're dealing with genotoxicity,
2 which is what you're dealing with with benzene, the
3 time, as we already elaborated and as I already
4 testified to, when you're talking about initiator, or
5 something that's genotoxic, that there's only so much
6 that you can make from duration, because these are
7 genotoxic substances. And so you -- you again -- you
8 evaluate the entire literature and the weight of the
9 evidence when you're trying to make any sort of
10 formal opinion.

11 So it's not that I only chose to do one.
12 This was a study that -- if you review all of it, I
13 mean, I didn't choose to talk about the parts per
14 million, and the constant parts per million, and the
15 cumulative parts per million. This is just one
16 element of a study that looked at non-Hodgkin
17 lymphoma and benzene, which, regardless, is known to
18 be -- have sufficient evidence -- not just because I
19 said it, but because IARC has said it, and ATSDR has
20 said it -- that benzene is a cause of a non-Hodgkin
21 lymphoma.

22 Q. The number of cases in the Hayes study
23 that looked at duration is a total of 16. Correct?

24 A. Correct. And only one of them was under
25 5 years. So again, 16 cases, when you're talking

1 about a disease that there are 8,000 new cases of
2 diffuse large B-cell lymphoma diagnosed every year,
3 is not a lot. So to try and make any sort of
4 analysis on the number of cases when you're talking
5 about exposure levels that are very small, you're
6 talking about numbers of patients in the study that
7 actually have diffuse large B-cell lymphoma -- or
8 non-Hodgkin lymphoma; we don't even know if those are
9 even diffuse large B-cell lymphomas.

10 There's only so much you can go by. You
11 have to -- again, that's why you just can't take one
12 article and -- and show it and say, "Well, look,
13 well, that study didn't show it. There you go."

14 No, that's why I had -- I spent hours and
15 hours looking at all the references, because this is
16 non-Hodgkin lymphoma. That -- the cases that were
17 associated could have been mantle cell lymphoma; they
18 could have been marginal zone lymphoma; they could
19 have been follicular lymphoma.

20 Now, diffuse large B-cell lymphoma is the
21 most common lymphoma in the United States, but this
22 is China, so maybe there was a Burkitt lymphoma,
23 because Burkitt lymphoma is more common in China.

24 So you have to basically look at multiple
25 studies and go based on a lot of evidence to come to

1 any sort of conclusion.

2 Q. One of the studies that you referenced
3 earlier today is -- and correct me if I'm wrong, but
4 the -- the Nilsson study. It's footnote 46.

5 And I can read the sentence into the
6 record that associates with it: "A study of two
7 cohorts of male Swedish seamen exposed to cargo
8 vapors from gasoline and other petroleum products
9 containing benzene reported a statistically
10 significant increase in non-Hodgkin lymphoma
11 (OR equals 3.3; 95 percent confidence interval
12 equals 1.1 to 10.6) in those workers with at least
13 one month of an exposure history, including a noted
14 significant exposure-response relation when
15 evaluating all lymphatic and hematopoietic
16 malignancies."

17 Do you see that sentence?

18 A. Yes.

19 Q. And I believe you referenced this study
20 earlier today when you were talking about duration?

21 A. I don't remember specifically referencing
22 this study.

23 I -- I mentioned the name?

24 Q. I believe -- well, the record will speak
25 for itself, but we'll just proceed forward.

1 I've put it in the chat.

2 A. Okay.

3 Q. And I'll also put it up on the screen.

4 (Exhibit 10 was marked for identification.)

5 MS. HORAN: I'm marking as Exhibit 10,
6 this is a study by Ralph Nilsson, titled
7 "Leukaemia, lymphoma, and multiple myeloma in
8 seamen on tankers."

9 BY MS. HORAN:

10 Q. Is this the study that you relied on in
11 your report?

12 A. I believe so, yes.

13 Q. Turning to Table 1, the total number of
14 non-Hodgkin's lymphoma cases considered in this study
15 was 17. Is that correct?

16 A. Right. That's in the 1960 cohort.

17 Q. And then in the 1970s cohort, there was
18 another additional 20. Is that correct?

19 A. Correct.

20 Q. Okay. And the increased risk, that you
21 cite to in your report, is that there was an
22 increased risk if the individual was on a chemical or
23 product tanker, but not if they were on a crude oil
24 tanker only. Correct?

25 A. I have to look at my report.

1 Q. Does Table 1 support that that there was
2 an increased risk if an individual was on a chemical
3 or product tanker, but not if they were on a crude
4 oil tanker only?

5 A. Again, I have to review what I said in my
6 report.

7 Q. Okay.

8 A. So could you repeat your question?

9 Q. Sure. Table 1 shows that there was an
10 increased risk if the individual was on a chemical or
11 product tanker, but does not have the same increased
12 risk if you were on a crude oil tanker.

13 MS. GJONAJ: Objection. Form.

14 THE WITNESS: Correct. So it's the 1970
15 cohort versus the 1960 cohort.

16 BY MS. HORAN:

17 Q. Under "Exposure," the third paragraph
18 down, the first sentence reads: "The seaman was
19 classified as exposed to cargo vapours, if he had
20 worked for at least one month as a mate, boatswain,
21 able seaman, or pumpman on a chemical tanker, product
22 tanker, or crude oil tanker, which included
23 oil-bulk-ore tankers." Do you see that sentence?

24 A. Yes.

25 Q. How does that exposure compare to

1 Mr. Vidana's?

2 MS. GJONAJ: Objection to form.

3 THE WITNESS: Could you repeat that?

4 BY MS. HORAN:

5 Q. Sure. The way they classified exposure in
6 this study -- I read one sentence, but you're
7 obviously welcome to read more.

8 How would you compare that to the
9 exposure, Mr. Vidana's exposure, to water at
10 Camp Lejeune?

11 MS. GJONAJ: Objection. Form.

12 THE WITNESS: Well, only in the sense that
13 that exposure -- and again, this is what you do
14 with these observational studies,
15 epidemiological studies, is try and assign a
16 group to prevent misclassification that would be
17 more likely exposed to a particular carcinogen
18 in comparison to those that are not likely
19 exposed to that carcinogen.

20 So that's how I would compare Mr. Vidana
21 being at a location where he was exposed to a
22 known -- to known carcinogens and that that's
23 the comparison here, is that what these authors
24 are trying to do is assign these groups in a way
25 that you can be assured that there is minimal

1 misclassification of nonexposed people in an
2 exposed group.

3 So that's the analogy that's -- that's
4 being done here. Again, as I said earlier, you
5 can never find a perfect scenario that exactly
6 matches any particular case or any particular
7 subject or any particular patient; that you have
8 to use other study designs that have been used
9 in order to -- to classify exposure to certain
10 chemicals and carcinogens and apply that
11 information to whatever case you're dealing with
12 at the time, in the context of all of the other
13 information in addition to the epidemiology.

14 MS. GJONAJ: Can we pause for just one
15 second? I'm curious how much -- how long we've
16 been on the record.

17 VIDEOGRAPHER: Six hours and 38 minutes.

18 BY MS. HORAN:

19 Q. I'm showing on the screen -- this is
20 exhibit -- an exhibit; excuse me -- that has been
21 previously marked as Exhibit 2. And this is your
22 "Materials Considered" list. And I'm turning to
23 page 4.

24 Do you see that this was a study, Yu 2025,
25 that was disclosed as a study that you had

1 considered?

2 A. Yes.

3 Q. Okay. And I think it just got disclosed
4 twice, but that's the same study as this -- the first
5 study on the next page, correct? It's the Yu 2025.
6 Or did you mean to -- to disclose something else?

7 A. No, that's -- that's correct.

8 MS. HORAN: Okay. And I've put it in the
9 chat, but I'll also share it on the screen.

10 I'm marking as Exhibit 11. This is a
11 study by Kevin -- Kexin Yu, titled "Long-term
12 exposure to low-level ambient BTEX and
13 site-specific cancer risk: A national cohort
14 study in the UK Biobank."

15 (Exhibit 11 was marked for identification.)

16 BY MS. HORAN:

17 Q. This is the study that you added to your
18 "Materials Considered" list, correct, Dr. Michaels?

19 A. Yes.

20 Q. And what about this study led you to add
21 it to -- to your "Materials Considered" list?

22 A. Well, the fact that they are looking at
23 low-level concentrations of benzene, among others,
24 specifically evaluating the risk for, in this case,
25 18 different site-specific malignancies.

1 Q. Do you know if this study controlled for
2 co-exposures?

3 A. Could you say that again?

4 Q. Do you know if the Yu study controlled for
5 co-exposures?

6 A. Well, this was looking at exposures to,
7 you know, again, benzene, toluene, ethylbenzene, and
8 xylene, with respect to, you know, volatile organic
9 compounds that are in the environment.

10 So it's included in -- in the evaluation.
11 So that's what the subject of the report is for.

12 And it separates -- it separates them
13 individually, based on their exposure profile. So if
14 you go to Figure -- Figure 1, I believe, separates
15 them, you know, based on whether it's benzene,
16 toluene, xylene, et cetera.

17 Q. Figure 1 is on page 4?

18 A. Correct.

19 Q. This study did not evaluate NHL subtypes,
20 correct?

21 A. That's correct.

22 Q. Do you know if this study would be
23 considered an ecological study?

24 A. Can you say that again?

25 Q. Sure. Are you familiar with the term

1 "ecological study" in the context of epidemiology?

2 A. I don't normally think of things in those
3 terms, so I don't know what would be considered an
4 ecological study. But I mean, this is published in
5 Eco-Environment & Health, so maybe that's what it
6 would be classified as, because you're dealing with,
7 you know, environmental exposures that would fall
8 into that realm.

9 But I don't know if that's how they would
10 classify the study.

11 Q. I've turned --

12 A. It's more just an exposure study to me.

13 Q. I've turned to page 5. And the top of the
14 page on the right column, above "Conclusion," it
15 reads: "The exposure assessment based on residential
16 address could not capture activity patterns of
17 individuals, thus potential exposure
18 misclassification might exist. Moreover, despite the
19 adjustment of a series of confounders, we could not
20 rule out residual confounding by other unmeasured
21 factors that might affect the exposure and cancer
22 incidence. Finally, indoor emissions are an
23 important source of BTEX. The lack of data on
24 individual indoor exposure is a common limitation in
25 environmental epidemiological research, and the

1 results should be interpreted with caution."

2 Do you see those sentences?

3 A. Yes.

4 Q. So there's no way to know which study
5 participants were exposed to what level of
6 contamination in this study, correct?

7 A. No, I don't think that that's correct,
8 because, you know, any author will go through their
9 study and address limitations; but they won't then
10 say, "Well, that means you can't rely on anything
11 that we're saying."

12 Because in their conclusion, which is
13 right below what you were reading, it says, and I
14 quote: "Our results suggest a link between long-term
15 low-level ambient BTEX exposure and overall cancer
16 incidence and 18 site-specific cancers in the UK
17 general population. Our findings carry specific
18 public health implications and highlight the need for
19 further research to corroborate these associations
20 and contribute to the evidence of carcinogenic
21 potential of BTEX."

22 So if they were saying in their study that
23 basically you can't use this study to make any sort
24 of assessments, they would not have concluded with
25 that. Any study is going to always highlight the

1 limitations of the study, things to interpret with
2 caution, the need for additional confirmatory
3 studies.

4 And that's exactly what they're doing
5 here. Again, with something that is an environmental
6 exposure, when you're always going to have a mix of
7 different carcinogens that may be at play, you have
8 to do your best, as a researcher, to separate out
9 what is a more likely chemical that's exposed or seen
10 in a particular population compared to another.

11 But again, unless you have a randomized
12 controlled trial -- which you can't ethically do for
13 any of these chemicals that we're talking about
14 today -- you can't really completely control for all
15 these different variations and co-variables that
16 you're going to see.

17 And some authors do a better job than
18 others. And I think this -- this particular group
19 did a fairly good job at trying to control for other
20 co-variables. But again, they're always going to add
21 in a statement evaluating what limitations they have
22 in these studies, and there's always going to be
23 limitations when you have any sort of environmental,
24 occupational, or any sort of similar epidemiological
25 study that you can't completely control for exposures

1 to other chemicals that would be included.

2 Q. I'm going to take this down.

3 Dr. Michaels, your opinions have been
4 excluded by a judge before. Correct?

5 A. I don't know what case you're talking
6 about.

7 Q. Do you know whether your opinions have
8 ever been excluded by a judge before?

9 A. I think that there's something currently
10 pending about ranitidine litigation where it's on
11 appeal, and all of the experts were uniformly -- I
12 don't know if we were -- I don't know the legal term,
13 if they were excluded or not.

14 But as a general rule, that's not been my
15 experience. And I -- my understanding is that
16 that's -- that's under appeal.

17 Q. Are you referencing Bergen v. Ethicon?

18 A. No, I don't -- I don't know that.

19 Q. Were you an expert in Bergen v. Ethicon?

20 A. I -- I don't remember. I testified
21 against Ethicon several times.

22 Q. Were you an expert in Childress v. Johnson
23 & Johnson?

24 A. Again, I don't -- I don't -- I don't
25 memorize all of my -- I've been involved in over a

1 hundred cases and had over 60 depositions. So I
2 haven't -- I don't memorize all the different cases
3 I've been involved with.

4 It doesn't sound -- it doesn't necessarily
5 ring a bell. But I would have to see if my entire --
6 what you're describing, you're insinuating on the
7 record, that my entire opinion was -- if I did a
8 report in the case, that it was completely excluded.
9 So I'd like to see whatever you're talking about.

10 Q. I didn't say "completely."

11 A. You said my opinions have been excluded, I
12 think. So I mean, whether it's limited or excluded,
13 I think you could use probably a different word to be
14 clear for the record.

15 Q. Okay. Do you know if your opinions were
16 either partially or fully excluded in a case called
17 Childress v. Johnson & Johnson, sitting here today?

18 A. I don't know that. I would have to see,
19 because usually I'm not -- I don't know that I would
20 necessarily have been followed up with by the
21 attorneys if any of my opinions, for one reason or
22 another, were limited in a specific case.

23 Q. Have you worked on the In Re: Zantac
24 cases?

25 A. Yeah, I just talked about ranitidine,

1 which is Zantac, yes.

2 Q. And you said you have testified several
3 times against Ethicon?

4 A. Yes.

5 Q. And have you testified against Wyeth?

6 A. Yes.

7 Q. And have you testified against Zority?

8 A. That doesn't sound familiar.

9 Q. So the case Bundalo v. Zority doesn't ring
10 a bell to you?

11 A. Oh, Zority? That's an OB/GYN. That's a
12 physician.

13 Q. Sure. Did you testify in that case --

14 A. No.

15 Q. -- or offer an opinion?

16 No? Okay.

17 A. I -- I offered an opinion in that case.
18 That was a -- a local case in Las Vegas about an
19 OB/GYN that committed severe malpractice. So yes,
20 I -- I was asked to consult on that case.

21 Yeah, Zority. Sorry. It was -- you were
22 talking about different companies. And then you
23 threw that in there so I didn't recognize it.

24 Q. Sure. But now you do remember offering an
25 opinion in Bundalo v. Zority?

1 A. Yes.

2 Q. You mentioned earlier that you had
3 received a draft of Dr. Reynolds' report before you
4 submitted your own report. Is that correct?

5 A. That's my recollection, correct.

6 Q. Did you ever do a line by line comparison
7 between the draft that was sent to you and the one
8 that is listed on your "Materials Considered" list to
9 see if there were any changes?

10 A. In fact, I think that I testified that I
11 did not do a line by line comparison, but that there
12 was nothing that I noticed that seemed different to
13 me and certainly nothing that I focused on that would
14 have been something that I would have relied on from
15 her report.

16 Q. And one of the things that you did not
17 rely on from Dr. Reynolds' report was her total
18 amount of exposure final conclusions?

19 A. Well, I -- I saw those total exposure. I
20 reviewed them. But based on the totality of the
21 evidence, I looked at them in the context of all of
22 the other data in this case. So it wasn't that I --
23 I didn't rely on them because I did notice them. I
24 saw how she came to those calculations. I think that
25 her calculations are valid based on the assumptions

1 that she made about timing, et cetera. But it's not
2 something that was a huge factor in coming to the
3 ultimate conclusion in this case I should say.

4 Q. And you did not include those total
5 exposure opinions that Dr. Reynolds offers in your
6 expert report, correct?

7 MS. GJONAJ: Objection. Form.

8 THE WITNESS: Again, so my objective -- or
9 my expert report, I did not include any of her
10 draft data, which is what I had at the time
11 before it was finalized. I had reviewed it. I
12 had, you know, evaluated it. And I ended up
13 only using in my report that I put in writing
14 about the actual exposure levels that were a
15 monthly average over that same period of time
16 which is what she also referenced in her tables.

17 BY MS. HORAN:

18 Q. Dr. Michaels, thank you very much for your
19 time today. I have no further questions for you.

20 MS. GJONAJ: Can we take a short break?

21 MS. HORAN: Yes.

22 VIDEOGRAPHER: We're going to go off
23 record at 5:17 p.m.

24 MS. GJONAJ: Until 8:25?

25 MS. HORAN: Sure.

1 MS. GJONAJ: Okay.

2 MS. HORAN: 8:25 time East Coast.

3 MS. GJONAJ: East Coast, yes.

4 (A recess transpired from 5:17 p.m. until
5 5:24 p.m.)

6 VIDEOGRAPHER: All right. One second.

7 Stand by. Back on record at 5:24 p.m.

8 MS. GJONAJ: Dr. Michaels, I appreciate
9 your time. I have no additional questions.
10 Thank you.

11 COURT REPORTER: Counsel, would you like a
12 rough draft?

13 MS. GJONAJ: I would, please.

14 MS. HORAN: We would as well.

15 VIDEOGRAPHER: All right. This ends
16 today's deposition. We're going to go off the
17 record at 5:24 p.m.

18 (Time Noted: 5:24 p.m.)
19
20
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C E R T I F I C A T E

I do hereby certify that I am a Notary Public in good standing, that the aforesaid testimony was taken before me, pursuant to notice, at the time and place indicated; that said deponent stated to tell the truth, the whole truth, and nothing but the truth under penalty of perjury; that the testimony of said deponent was correctly recorded in machine shorthand by me and thereafter transcribed under my supervision with computer-aided transcription; that the deposition is a true and correct record of the testimony given by the witness; and that I am neither of counsel nor kin to any party in said action, nor interested in the outcome thereof.

WITNESS my hand this 18th day of August, 2025.



Karen K. Kidwell, RMR, CRR
Registered Merit Reporter
Certified Realtime Reporter
Notary Public

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Please read your deposition over carefully and make any necessary corrections. You should state the reason in the appropriate space on the errata sheet for any corrections that are made.

After doing so, please sign the errata sheet and date it.

You are signing same subject to the changes you have noted on the errata sheet, which will be attached to your deposition.

It is imperative that you return the original errata sheet to the deposing attorney within thirty (30) days of receipt of the deposition transcript by you. If you fail to do so, the deposition transcript may be deemed to be accurate and may be used in court.

1		- - - - -
		E R R A T A
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I, _____, do
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me to the questions therein propounded,
except for the corrections or changes in form
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me this _____ day of _____, 20____.

My commission expires:

Notary Public

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(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.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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