UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NORTH CAROLINA
SOUTHERN DIVISION

FRANK MOUSSER,	)	
	)	
Plaintiff,	)	Docket No.
	)	7:23-CV-00667-BO-RN
v.	)	
	)	
UNITED STATES OF AMERICA,	)	
	)	
Defendant.	)	

****

TUESDAY, OCTOBER 27, 2026
TRANSCRIPT OF BENCH TRIAL - DAY 2
BEFORE THE HONORABLE TERRENCE W. BOYLE
UNITED STATES DISTRICT JUDGE

TAMMY JOHNSON, CVR-CM-M, RVR
Official Court Reporter
United States District Court
Raleigh, North Carolina
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Tuesday, October 27, 2026, 9:49 a.m.

PROCEEDINGS

09:49:29 THE COURT: Good morning. I think the plaintiff was
09:49:36 on the stand with cross.
09:49:39 MR. GARAND: Yes, Your Honor.
09:49:39 THE COURT: All right. We'll resume with that.
09:49:51 Okay.
09:49:51 FRANK MOUSSER,
09:49:51 having been previously sworn, resumed the witness stand at
09:49:51 9:49 a.m., and testified as follows:
09:49:53 THE COURT: You're still under oath.
09:49:55 THE WITNESS: Yes, sir.
09:49:58 MR. GARAND: And, Your Honor, briefly, United
09:49:59 States -- United States discussed with Mr. Mousser United
09:50:03 States Exhibits 371 and 910. And my colleague, Giovanni
09:50:05 Antonucci, on his cross with Dr. Reynolds, also used an
09:50:11 illustrative aid that we're marking as United States Exhibit
09:50:14 2008. We move those exhibits into evidence.
09:50:14 THE COURT: They're received.
09:50:14 (Defendant's Exhibit Numbers 371, 910 and 2008
09:50:14 received.)
09:50:14 CONTINUED CROSS-EXAMINATION BY MR. GARAND:
09:50:14 Q. Good morning, Mr. Mousser.
09:50:23 A. Good morning.
09:50:25 Q. Mr. Mousser, yesterday we were talking about your

09:50:28 employment at Mercer Motor Company. Do you recall that?
09:50:30 A. I do.
09:50:31 Q. And the setup and position at Mercer Motor Company was not
09:50:33 what you expected, correct?
09:50:38 A. I wouldn't say that.
09:50:40 Q. Mr. Mousser, if you could flip to tab 22 in your binder.
09:50:48 Please let me know when you're there, Mr. Mousser.
09:50:49 A. Okay.
09:51:00 Q. Mr. Mousser, at the top, this is a "Mental Health
09:51:02 Outpatient Note" from December of 2023. Do you see that?
09:51:04 A. Yes.
09:51:06 Q. And in the bottom left-hand corner is your name under the
09:51:09 patient name, correct?
09:51:12 A. Yes.
09:51:13 Q. In this bottom paragraph, about four lines down, the
09:51:17 treatment provider writes that, "Adding to his depression is
09:51:20 his work situation. He moved to Seguin to assist a friend at
09:51:24 his dealership. The setup and position was not what he was
09:51:28 expected or described. He was a manager at his last dealership
09:51:32 and now is a common salesman with no independence. He feels
09:51:36 like he has back-slided in his career."
09:51:38 I read that correctly, Mr. Mousser?
09:51:40 A. You did.
09:51:41 MR. GARAND: Your Honor, the United States moves
09:51:43 Exhibit 270 into evidence.

09:51:45 THE COURT: Received.
09:51:45 (Defendant's Exhibit Number 270 received.)
09:51:49 Q. Mr. Mousser, let's discuss your testimony as to why you
09:51:51 stopped working. You claim you left your job with Mercer Motor
09:51:56 Company due to medical issues, correct?
09:51:59 A. Correct.
09:52:01 Q. And you enjoyed the automobile sales business, correct?
09:52:04 A. Yes.
09:52:05 Q. But your body had other plans, right?
09:52:07 A. Yes.
09:52:09 Q. Mr. Mousser, let's discuss some of your other medical
09:52:11 conditions that are unrelated to Camp Lejeune and the symptoms
09:52:15 that are associated with those conditions. One subset of
09:52:20 conditions that you have are cardiovascular issues, correct?
09:52:23 A. Yes.
09:52:24 Q. You're diagnosed with coronary artery disease, right?
09:52:28 A. Correct.
09:52:28 Q. You're diagnosed with hypertension, right?
09:52:33 A. Yes.
09:52:33 Q. And you were diagnosed with hypertension years prior to
09:52:36 your diagnosis of cancer, correct?
09:52:40 A. We had some blood pressure issues that were managed and
09:52:42 under control with medication.
09:52:44 Q. Okay. So yes, Mr. Mousser?
09:52:46 A. Yes.

09:52:47 Q. The answer to my question is yes?
09:52:47 A. Yes.
09:52:47 Q. Thank you. Mr. Mousser, you reported to one of your
09:52:54 experts in this litigation that your hypertension causes head
09:52:58 rushes, dizziness, blurry vision to the point of blacking out
09:53:02 and headaches, correct?
09:53:04 A. Correct.
09:53:07 Q. And it's fair to say that these symptoms associated with
09:53:09 your hypertension would impact your ability to work, right?
09:53:13 A. Yes.
09:53:15 Q. Mr. Mousser, we discussed your headaches. You told the
09:53:18 same expert in this litigation that the headaches are
09:53:21 completely debilitating, and they last two to ten hours,
09:53:24 correct?
09:53:25 A. Correct.
09:53:26 Q. You also attribute -- attributed these completely
09:53:29 debilitating headaches to your sleep issues, correct?
09:53:33 A. Correct.
09:53:37 Q. Mr. Mousser, let's discuss some of the causes of those
09:53:40 sleep issues. You told a VA provider a few months after you
09:53:44 retired that you had to quit work because you were falling
09:53:47 asleep all the time, correct?
09:53:49 A. Correct.
09:53:51 Q. You were diagnosed with sleep issues like insomnia and
09:53:54 daytime somnolence prior to your cancer diagnosis, correct?

09:54:00 A. No.
09:54:01 Q. Mr. Mousser, if you could flip to tab 28 for me, please.
09:54:18 THE COURT: This is just wasting time. If you've got
09:54:20 him saying the opposite, just go on.
09:54:24 MR. GARAND: Yes, Your Honor.
09:54:25 Q. Mr. Mousser, as to the cause of your insomnia, it's your
09:54:33 contention that your tinnitus caused your insomnia, correct?
09:54:38 A. No. You're taking out -- tinnitus can cause a lot of
09:54:41 different secondary issues, but I never claimed that. None of
09:54:44 the -- none of these issues happened till after 2020 with
09:54:47 insomnia, diabetes, high blood pressure that I had to be put on
09:54:51 multiple medications for. And I quit my job because of health
09:54:55 issues. That's the truth of it.
09:55:00 Q. Mr. Mousser, if you could flip to tab 29 for me, please.
09:55:16 Do you see your name in the top right-hand corner?
09:55:22 A. I do.
09:55:23 Q. Do you see that this treatment note is dated January 23,
09:55:26 2019?
09:55:29 A. Correct.
09:55:30 Q. If you flip to the next page, at the very bottom, there's
09:55:34 a number 5 diagnosing primary insomnia. Do you see that?
09:55:43 A. I do.
09:55:44 Q. And at the top of the next page, number 6 is daytime
09:55:47 somnolence, correct?
09:55:50 A. Correct.

09:55:50 Q. And the provider notes for you to consider sleep study in
09:55:53 the future for obstructive sleep apnea; states he snores
09:55:56 sometimes, correct?
09:55:59 A. Correct, but that's all lumped into the depression.
09:56:02 Q. Mr. Mousser --
09:56:03 MR. DOWLING: Your Honor, if I could just object.
09:56:04 The Government -- the Department of Veterans Affairs,
09:56:07 Plaintiff's Exhibit 120, has issued a finding that Mr. Mousser
09:56:13 is unemployable due to all of the issues that we're now just
09:56:17 going through piecemeal and relitigating.
09:56:21 I don't know that they can be estopped from doing
09:56:23 what they're doing, but I think the Court has the discretion to
09:56:27 stop a lot of duplicative, unhelpful cross-examination on
09:56:30 issues that another agency of this federal government has
09:56:34 already resolved in Mr. Mousser's favor.
09:56:36 THE COURT: Yeah, let's get finished with it. You're
09:56:38 wasting time.
09:56:40 MR. GARAND: Yes, Your Honor.
09:56:47 THE COURT: How much longer do you have?
09:56:49 MR. GARAND: I just have one more topic to discuss,
09:56:51 Your Honor.
09:56:52 THE COURT: What's that?
09:56:53 MR. GARAND: The smoking history.
09:56:55 THE COURT: We know he smoked. I mean, we've had
09:56:57 ample evidence about that. It's not going to impact. Just go

09:57:01 ahead and do it --
09:57:02 MR. GARAND: Thank you, Your Honor.
09:57:02 THE COURT: -- and get finished.
09:57:04 Did you smoke?
09:57:08 THE WITNESS: Very rarely, sir.
09:57:10 THE COURT: Once in a while, when you were having a
09:57:13 beer?
09:57:14 THE WITNESS: Very socially, yes, sir.
09:57:16 THE COURT: You testified to that, right?
09:57:17 THE WITNESS: I did.
09:57:18 THE COURT: Okay. What do you need to know?
09:57:21 MR. GARAND: Mr. Mousser has not testified on direct
09:57:24 as to the extent of his smoking history, and so we'd like that
09:57:27 in the record.
09:57:27 THE COURT: Well, just ask him, "Is it not a fact
09:57:30 that you smoked less than a pack a day, yes or no?"
09:57:34 MR. GARAND: Yes, Your Honor.
09:57:35 THE COURT: And that'd be it. That's all you need to
09:57:37 do.
09:57:38 MR. GARAND: Your Honor, we believe Mr. Mousser's
09:57:43 smoking history is more extensive than that, and we'd like to
09:57:46 explore that with him briefly.
09:57:47 THE COURT: He's got kidney cancer. He doesn't have
09:57:49 lung cancer.
09:57:50 MR. GARAND: Your Honor --

09:57:50 THE COURT: Okay. You don't need to get up. Let's
09:57:54 go.
09:57:54 MR. BAIN: Well, Your Honor --
09:57:54 THE COURT: Just go ahead and -- just go ahead and do
09:57:57 it.
09:57:57 MR. BAIN: -- this is a critical issue in this case,
09:57:57 Your Honor.
09:57:57 THE COURT: I can't hear you.
09:57:58 MR. BAIN: This is a critical issue in this case,
09:58:00 Your Honor.
09:58:01 THE COURT: I don't think so.
09:58:02 MR. BAIN: Well --
09:58:02 THE COURT: And I'm --
09:58:02 MR. BAIN: -- we have to establish a record.
09:58:03 THE COURT: -- and I'm deciding what the law and the
09:58:06 facts are.
09:58:07 MR. BAIN: We have to establish a record, Your Honor,
09:58:09 and you have to let us do that. This is a critical issue in
09:58:13 this case.
09:58:17 THE COURT: Go ahead and ask him.
09:58:19 Q. (By Mr. Garand) Mr. Mousser, you smoked in the Marines,
09:58:21 correct?
09:58:21 A. I did.
09:58:22 Q. You smoked about a pack every seven to ten days, correct?
09:58:27 A. Pretty rare, infrequent. I wouldn't call it a pack every

09:58:30 seven to ten days, but...
09:58:32 Q. Mr. Mousser, do you recall testifying to that at your
09:58:34 deposition?
09:58:35 A. I do.
09:58:38 Q. Mr. Mousser, you smoked until 2012, correct?
09:58:43 A. Very rare and infrequently.
09:58:45 Q. Is the answer to my question yes, Mr. Mousser?
09:58:50 A. It's kind of a double-bladed sword, isn't it? But very
09:58:55 infrequently.
09:58:59 Q. Mr. Mousser, you were -- you were in the courtroom
09:59:04 yesterday when we showed a record demonstrating that you smoked
09:59:08 a pack a week in 2020, correct?
09:59:11 A. You're talking about that thing that I've never seen?
09:59:13 Okay, let me tell you something, that is not true. I didn't --
09:59:17 I've never stated that to that person. I saw Dr. Schilling
09:59:21 once before he retired, and they never, ever said that I needed
09:59:25 to quit smoking because I was not smoking, and that's the
09:59:30 truth.
09:59:31 MR. GARAND: Your Honor, we move United States
09:59:33 Exhibit -- Exhibit 531 into evidence. That is what was shown
09:59:38 on this --
09:59:38 THE COURT: Denied.
09:59:38 MR. GARAND: -- demonstrative yesterday.
09:59:41 THE COURT: Denied. You can take it up and see if it
09:59:43 flips the case.

09:59:44 MR. GARAND: Okay. Thank you, Your Honor. I have no
09:59:45 further questions.
09:59:47 THE COURT: You got any questions?
09:59:48 MR. DOWLING: No questions, Your Honor. Thank you.
09:59:50 THE COURT: Step down.
09:59:51 THE WITNESS: Thanks.
09:59:51 (The witness exits the witness stand at 9:59 a.m.)
09:59:51 THE COURT: Any other witnesses?
09:59:59 MR. QUINN: Your Honor, very -- good morning. Good
10:00:04 morning, Your Honor. So the Court may recall that we took the
10:00:08 for-trial deposition of Dr. Matthew Cooper. Dr. Cooper --
10:00:11 THE COURT: I don't recall that. I have no idea of
10:00:14 that.
10:00:14 MR. QUINN: Yes, sir. We took the for-trial
10:00:16 deposition of Dr. Matthew Cooper. He was one of the
10:00:18 plaintiff's experts. He was -- he's in Korea right now. He
10:00:21 was unavailable to appear at trial.
10:00:23 We just want to be as cognizant and efficient with
10:00:27 the Court's time as possible. So what we are proposing, if it
10:00:31 pleases the Court, is to move Dr. Cooper's for-trial deposition
10:00:34 transcript into evidence instead of reading it from the stand.
10:00:37 Basically, what Dr. Cooper testified to is that
10:00:42 Mr. Mousser will need a kidney transplant within two to four
10:00:46 years, and that the loss of his kidney and the resulting
10:00:49 chronic kidney disease reduced Mr. Mousser's life expectancy by

10:00:53 ten years.
10:00:54 And, furthermore, Dr. Cooper approved the life care
10:00:57 plan that you will hear about very briefly from one of our next
10:01:01 witnesses. And so just in effort to be as efficient as
10:01:04 possible, we're proposing to move Dr. Cooper's for-trial
10:01:07 deposition transcript into evidence so we don't have to read
10:01:09 anything from the stand.
10:01:11 MR. GARAND: Your Honor, we have no objection. We'll
10:01:13 submit our exhibits that we entered into at that deposition.
10:01:16 THE COURT: All right. It'll all be received, and
10:01:18 the Court will take such notice of it as is necessary.
10:01:21 (Plaintiff's Exhibit Number 144 received.)
10:01:21 MR. QUINN: Thank you, Your Honor. If I may, just
10:01:23 for the record, then, Dr. Cooper's deposition transcript, we've
10:01:26 marked that as Exhibit 144. And then, furthermore, the --
10:01:31 Dr. Cooper's report and CV and an illustrative used in that
10:01:36 deposition were Exhibits 123, 124, 125, and 143, and so we
10:01:43 would also move those into the record.
10:01:45 THE COURT: They'll be received.
10:01:46 (Plaintiff's Exhibit Numbers 123 through 125 and
10:01:46 143 received.)
10:01:46 MR. QUINN: Thank you, Your Honor.
10:01:46 MR. GARAND: And, Your Honor, the exhibits we used
10:01:48 were marked as 2009 -- United States Exhibit 2009 and United
10:01:52 States Exhibit 2010. We move those into evidence as well.

10:01:55 THE COURT: I'll take those into account.
10:01:57 (Defendant's Exhibit Numbers 2009 and 2010 received.)
10:01:57 MR. GARAND: Thank you, Your Honor.
10:01:58 MR. ABRAMS: Your Honor, the plaintiff calls Michael Fryar to the stand. This should -- just to give you a preview, 10:02:00 this should take --
10:02:05 THE COURT: I can't hear you.
10:02:06 MR. ABRAMS: This should probably take five minutes.
10:02:06 THE COURT: Okay.
10:02:09 THE CLERK: Please place your left hand on the Bible, 10:02:20 raise your right hand, and state and spell your name for the 10:02:20 record.
10:02:20 THE WITNESS: Michael Alan Fryar, M-I-C-H-A-E-L 10:02:20 A-L-A-N F-R-Y-A-R.

MICHAEL ALAN FRYAR, M.S.,
was sworn at 10:02 a.m., and testified as follows:

10:02:28 DIRECT EXAMINATION BY MR. ABRAMS:
10:02:53 Q. Mr. Fryar, would you please introduce yourself to Judge 10:02:56 Boyle?
10:02:56 A. I'm Michael Alan Fryar. I was born in Eastern North 10:03:01 Carolina. I went to East Carolina University here and UNC 10:03:06 Chapel Hill. I currently live in the western part of the 10:03:10 State. I'm a rehab nurse, rehab counselor, life care planner.
10:03:14 Q. What did you do in this case?
10:03:16 A. I prepared a cost analysis secondary to my consultation

10:03:20 with Dr. Cooper about the kidney transplant.
10:03:24 Q. In simple terms, what does that mean?
10:03:26 A. I assigned unit costs to the care Dr. Cooper recommended
10:03:31 for the kidney transplant so that could be provided to an
10:03:34 economist to project out over lifetime.
10:03:37 Q. So you figured out how much it costs to get the various
10:03:41 procedures and things that Dr. Cooper says that Mr. Mousser
10:03:44 needs?
10:03:44 A. I did, yes.
10:03:46 Q. And you do this on a regular basis?
10:03:50 A. Every day.
10:03:50 MR. ABRAMS: Your Honor, we would tender Mr. Fryar as
10:03:53 a life care planner, expert in life care planning.
10:03:58 MR. TUBIN: Your Honor, we object. We do not believe
10:04:00 that Dr. Fryar has been sufficiently qualified under 702.
10:04:04 THE COURT REPORTER: Tell me your name, sir.
10:04:04 MR. TUBIN: Marcus Tubin, T-U-B-I-N.
10:04:04 THE COURT REPORTER: Thank you.
10:04:04 THE COURT: Where is he on your pretrial order list
10:04:15 of witnesses? What's his name?
10:04:20 MR. ABRAMS: Fryar, F-R-Y-A-R. This should be
10:04:32 incredibly unobjectionable. This guy did exactly what the
10:04:39 Government's experts did using the same databases. All he's
10:04:43 doing, Judge, is giving us a basis to figure out how much the
10:04:47 care that Mr. Mousser needs is going to cost.

10:04:51 MR. TUBIN: We're not objecting to what he may have
10:04:53 done. We're objecting to whether he's been sufficiently
10:04:56 qualified, based on that brief line of questioning.
10:05:02 THE COURT: Overruled. Go ahead.
10:05:03 Q. (By Mr. Abrams) And just, Mr. Fryar, Plaintiff's Exhibit
10:05:08 131, that's your report and your CV? You've seen it before.
10:05:13 It's --
10:05:13 A. Yes.
10:05:15 Q. And your CV is in there?
10:05:17 A. Yes, sir.
10:05:18 Q. And that lays out your qualifications?
10:05:21 A. Yes, sir.
10:05:22 Q. You went to school to do this?
10:05:23 A. I did. I have three different degrees. I have a bachelor
10:05:26 of arts in psychology. I have a nursing degree and, actually,
10:05:30 I have a dual master's degree. The nursing and the dual
10:05:33 master's are related to doing projections like this.
10:05:37 Q. And how did you come up with the unit cost for the care
10:05:45 that Mr. Mousser is going to need?
10:05:47 A. I applied a published and peer-reviewed methodology from
10:05:50 life care planning, which I triangulated three different large
10:05:54 databases at the 50th to 75th percentile for Mr. Mousser's
10:05:59 region based on the Geozip, and that gave me the unit cost for
10:06:02 every item based on standardized coding by the AMA.
10:06:07 Q. And you got a master's in rehabilitation counseling and

10:06:10 vocational education?
10:06:11 A. Vocational evaluation. It's a dual master's, yes, and I'm
10:06:14 also a nurse.
10:06:17 Q. And you've been accepted by courts to do this exact type
10:06:20 of testimony tons of times?
10:06:22 A. Yes. I've been deposed probably 200 times, been accepted
10:06:25 in multiple courts.
10:06:30 Q. And all that's laid out in your report and your CV that's
10:06:34 attached to it?
10:06:34 A. Yes, sir.
10:06:35 Q. And that's at Plaintiff's Exhibit 131?
10:06:37 A. Yes, sir.
10:06:38 MR. ABRAMS: Your Honor, we'd move his report, which
10:06:40 includes his CV and all of his qualifications, into evidence.
10:06:44 THE COURT: It'll be received.
10:06:44 (Plaintiff's Exhibit Number 131 received.)
10:06:46 Q. And just what you did is you figured out the unit cost for
10:06:50 how much different types of care this man's going to need, and
10:06:53 then the next witness and economist put all that together to
10:06:57 get a total, right?
10:06:58 A. That's correct. He applies present value to it. So I
10:07:01 give him the unit cost, and he applies interest, inflation to
10:07:03 those numbers.
10:07:04 Q. Okay.
10:07:05 MR. ABRAMS: That's all the questions I have.

10:07:07 THE COURT: Do you have any cross?
10:07:08 MR. GUYNN: Cross, briefly.
10:07:09 CROSS-EXAMINATION BY MR. TUBIN:
10:07:09 Q. Mr. Fryar, you are a rehabilitation consultant, correct?
10:07:15 A. That's one of the titles. I'm also a life care planner, yes.
10:07:18
10:07:19 Q. You didn't do a rehabilitation consultation in this case, right?
10:07:22
10:07:22 A. I did a cost analysis. It's not required for that.
10:07:25 Q. Is a cost analysis a rehabilitation evaluation?
10:07:27 A. Not in the context of doing a life care plan, no.
10:07:31 Q. Is the answer, no, you didn't do a rehabilitation consultation?
10:07:35
10:07:35 A. I didn't do a consultation with Mr. Mousser. I did a cost analysis based on what Dr. Cooper recommended.
10:07:39
10:07:41 Q. Right. You never spoke or interviewed Mr. Mousser, right?
10:07:44 A. Correct. That's just not part of the process for a cost analysis.
10:07:46
10:07:46 Q. You're also a life care planner, right?
10:07:48 A. I am.
10:07:49 Q. You didn't do a life care plan in this case, did you?
10:07:51 A. I did not for a specific reason.
10:07:55 Q. You have no opinion on Mr. Mousser's lost earning capacity claim, do you?
10:07:58
10:07:59 A. I was not asked to give one.

10:08:02 Q. You're not qualified to prescribe treatments like a doctor would, correct?
10:08:06 A. No. I'm a nurse. I can implement care, but not prescribe. I was relying on Dr. Cooper.
10:08:08 Q. The two main items in your cost analysis plan are kidney transplant and dialysis; is that fair?
10:08:10 A. There's some doctors' visits, lab studies, but, yeah, those are the two main items. You're correct.
10:08:12 Q. They all stem from those two items, correct?
10:08:17 A. They're care required because of those items, yes.
10:08:20 Q. And you had to rely on Dr. Matthew Cooper for those items, correct?
10:08:22 A. Correct. That's the process of doing a cost analysis or a life care plan, for that matter.
10:08:23 Q. Dr. Cooper is retained by plaintiffs as an expert witness, right?
10:08:26 A. Yes.
10:08:29 Q. Dr. Cooper never examined Mr. Mousser, did he?
10:08:32 A. To my knowledge, no. He reviewed the records. He's a transplant specialist.
10:08:33 Q. You don't have any evidence Dr. Cooper even spoke to Mr. Mousser, right?
10:08:36 A. I'll defer that to Dr. Cooper. I don't know.
10:08:37 Q. So you don't have any evidence that he ever spoke to Mr. Mousser, do you?
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10:08:58 A. Not at the time we spoke, no.
10:09:01 Q. Dr. Cooper said the basis for a kidney transplant or
10:09:04 dialysis is plaintiff's current rate of kidney decline,
10:09:07 correct?
10:09:08 A. Yes, that's what he told me.
10:09:10 Q. Earlier this month, you wrote an addendum that summarizes
10:09:12 some recent medical treatment, right?
10:09:13 A. I did.
10:09:13 Q. None of those records say plaintiff's kidney function was
10:09:18 declining, do they?
10:09:19 A. At one point, it said it's stable. There's different
10:09:22 measurements about what his kidney function is.
10:09:24 Q. At one point it says stable, or does it say stable
10:09:26 numerous times?
10:09:27 A. In those recent records, it said stable once, I think, but
10:09:30 in previous records, yes, multiple times.
10:09:43 Q. Now, your addendum also refers to a mental health
10:09:46 appointment in 2025, right?
10:09:49 A. Yes.
10:09:49 Q. And plaintiff alleges his depression and anxiety are
10:09:53 related to his kidney cancer, right?
10:09:56 A. Yes.
10:09:57 Q. You did not consult with the mental health care provider
10:09:59 here, right?
10:10:00 A. No, I did not. I didn't put mental health care into the

10:10:04 plan --
10:10:05 Q. Right. Mental health --
10:10:05 A. -- into the cost analysis.
10:10:06 Q. -- care was not in your cost analysis?
10:10:07 A. It' not. It was based on what Dr. Cooper relayed to me.
10:10:10 He's a transplant specialist.
10:10:12 Q. He's not a mental health professional?
10:10:14 A. No.
10:10:16 Q. All the materials you received in this case came from
10:10:18 plaintiff's attorneys, right?
10:10:22 A. Well, I mean, I had the research I relied upon as far as
10:10:26 databases and other projection research, but the medical
10:10:28 records, yes.
10:10:29 Q. I can show you your testimony here, sir, from this case,
10:10:32 but I asked you who gave you the materials in this case, and
10:10:35 you answered the plaintiff's attorneys. Do you recall that?
10:10:37 A. I do. That was the medical records I was referring to.
10:10:40 Q. You didn't specify medical records in your testimony, sir.
10:10:44 A. Okay. Well, I got the medical records from them.
10:10:46 Q. They prepared a file and gave it to you, right?
10:10:49 A. Not a paper file. They electronically submitted to my
10:10:52 company.
10:10:53 Q. You're drawing a distinguish [sic] between a paper file
10:10:55 and an electronic file?
10:10:57 A. I'm just being transparent how I got the records. They

were -- they were not, like, a paper file.
Q. They prepared the file for you, right?
A. They sent me the records.
Q. You didn't ask for additional materials from them, right?
A. They were pretty comprehensive, but, no, I didn't ask for anything --
Q. You never tried to talk to any of the doctors that took care of plaintiff, did you?
A. So I've tried in the past to speak to the VA doctors. They don't respond about cost analyses, life care plans.
Q. I'm not talking about the past, sir.
MR. ABRAMS: Well, Your Honor --
Q. I'm talking about this case.
MR. ABRAMS: Your Honor, he's trying to answer the question, so -- and I've heard that the court reporter is having trouble when people talk over each other.
THE COURT: Be a little more polite. You know, politeness goes a long way.
MR. TUBIN: Okay, Your Honor. Sorry.
Q. You never tried to talk to any of the doctors taking care of Mr. Mousser, correct?
A. I did not reach out to them. I did not think they would be able to respond.
Q. You never saw the deposition of plaintiff's treating urologist, right?

10:11:51 A. No. That's -- I wouldn't go to a urologist for a
10:11:54 transplant and that. I would go to a transplant specialist.
10:11:56 Q. And plaintiffs never put that in the file they gave you,
10:11:58 right?
10:11:59 A. I don't think I ever saw that depo. You're correct.
10:12:02 Q. And you supplemented your materials considered several
10:12:05 times, correct?
10:12:05 A. Just once.
10:12:08 Q. Just once?
10:12:09 A. I wrote two reports, if that's what you mean.
10:12:13 Q. In neither -- in your supplement, you nowhere listed the
10:12:19 deposition of plaintiff's treating kidney specialist?
10:12:21 A. I agree.
10:12:24 Q. The depo is not in any of your supplemental material
10:12:26 considered list, right?
10:12:28 A. Correct.
10:12:29 Q. Would you agree that a treating physician, the doctor
10:12:32 taking care of Mr. Mousser, has more experience with a patient
10:12:36 than Dr. Cooper, the consultation physician?
10:12:39 A. I would agree he has more experience, but I would go to
10:12:42 the specialist about something concerning a transplant.
10:12:44 Q. None of the doctors who actually take care of plaintiff
10:12:48 have said he needs a transplant, have they?
10:12:52 A. Not in the records I reviewed, no.
10:12:54 Q. None of the doctors who take care of plaintiff have said

he will need dialysis in three to five years, have they?
A. No.
Q. There's no evidence plaintiff has even set up an appointment with a transplant surgeon, is there?
A. Not that I've seen.
Q. You never interviewed Mr. Mousser, right?
A. No. It was not part of the process for a cost analysis, so no.
Q. Neither Mr. Mousser nor any of his treating doctors provided any input into your cost analysis, right?
A. No. It's specifically Dr. Cooper.
Q. And you're not here to say whether plaintiff will need a kidney transplant, right?
A. No. I'm deferring that to the doctors. That's outside --
Q. You're not here --
A. -- my scope.
Q. Sorry, sir. You're not here to say whether he will need dialysis, right?
A. Again, outside of my scope. I'll defer that to the doctors.
Q. You're just here to say what the cost would be if he needs those items?
A. Correct.
Q. If the assumption that plaintiff will need a kidney transplant is wrong, then your pricing is not relevant, right?

10:13:49 A. Those items would have to come out if that was wrong, yes.
10:13:51 Q. And that would pertain to -- and that would pertain to any
10:13:58 other items in his cost analysis?
10:14:02 A. Well, there was a need for attendant care late in life,
10:14:04 but that was secondary to the failure of the kidney. So in
10:14:07 that context, yes.
10:14:09 Q. And you never reviewed the deposition or spoke with his
10:14:11 treating nephrologist either, correct?
10:14:14 A. No. I did -- I spoke to Dr. Cooper.
10:14:16 MR. TUBIN: That's all the questions I have, Your
10:14:17 Honor.
10:14:17 THE COURT: All right. Anything further?
10:14:20 MR. ABRAMS: No, Your Honor.
10:14:20 THE COURT: Thank you, sir.
10:14:21 THE WITNESS: Thank you.
10:14:22 (The witness exits the witness stand at 10:14 a.m.)
10:14:22 THE COURT: Next witness.
10:14:22 MR. ABRAMS: The plaintiff calls Chad Staller,
10:14:33 assuming he's in here. We may have to -- I guess not.
10:14:42 Your Honor, we've got the economist. We just need to
10:14:47 get his report into evidence, and maybe he's at the state
10:14:53 courthouse, so that's a --
10:14:56 THE COURT: What's that?
10:14:57 MR. ABRAMS: We've got a witness who is apparently
10:15:00 not in the courtroom. It's about the simplest testimony that

could ever be. So what I'd ask you to do is just allow us to call him when we find him. It'll take us five minutes.

THE COURT: Okay.

MR. ABRAMS: I know he's in town because he called me and he told me he was in the courtroom, but -- or courthouse.

What he's going to do is just give you the total cost of care. It's going to cost $800,000 to take care of this man if he needs a kidney transplant and dialysis, which is what our doctor, who we got the deposition introduced just now, says he needs. So that's all it is.

The Government's going to have their person who says he needs $4,000 of care for the rest of his life. Our guy says he needs $800,000 of care for the rest of his life. All of that comes down to what the transplant doctor says. That's in the -- in the deposition that we just introduced.

So this guy is just an economist. He's going to tell you he looked at the numbers, and we'll get his report in as soon as we can.

THE COURT: But he's not here?

MR. ABRAMS: He's in town, but I don't see him behind me when I called his name, so that's -- I apologize, Your Honor.

THE COURT: Is he your last witness?

MR. ABRAMS: He is, Your Honor. What I would do, if I may, his report is Plaintiff's Exhibit 128. His CV is --

10:16:29 THE COURT: I'll tell you what, I'll allow you to rest, subject to being reopened for this witness.

10:16:34 MR. ABRAMS: Thank you, Your Honor.

10:16:36 THE COURT: Okay. So have you rested?

10:16:39 MR. ABRAMS: Let me just check with my team here, but I'm pretty sure.

10:16:42 (Brief pause.)

10:16:44 MR. ABRAMS: Yes. Subject to that caveat, yes, Your Honor.

10:16:47 THE COURT: Okay.

10:16:47 MR. BAIN: Your Honor, would you like us to make our motion now?

10:16:50 THE COURT: Sure.

10:16:52 MR. ANWAR: Okay. Your Honor, for the record and preservation purposes, we'd move for judgment on partial findings in the United States' favor pursuant to Federal Rule of Civil Procedure 52(c).

10:17:04 Rule 52(c) authorizes a District Court sitting without a jury to enter judgment as a matter of law against a party on any claim once the party has had a full opportunity to present evidence on that claim.

10:17:17 As the Court made clear in its specific causation order dated June 5th, 2024, plaintiffs bear the burden of establishing exposure, general causation, specific causation. And as the United States has outlined in its pending summary

judgment motion, that requires reliable expert testimony. We believe the record demonstrates that plaintiffs have failed on each of those steps, exposure, general causation and specific causation.

On exposure, they rely on a model which the agency said can't be used for the purpose of determining individual exposure, in which their own expert admitted at the time that it was being developed, would not -- did not meet the scientific standards for court.

On general causation, they offered an expert that reduced his methodology based on the statute's at least as likely as not standard, and failed to perform a reliable Bradford Hill analysis. He did not testify to any associations, statistically significant or otherwise, between UTUC and the contaminants at Camp Lejeune.

He also admitted that the results of the 2024 Camp Lejeune Cancer Incidence Study failed to find any statistically significant relationships between the Camp Lejeune water and kidney cancer, urothelial cancer, or bladder cancer when a Camp Lejeune cohort was compared to a cohort at Camp Pendleton.

And seven of the ten statistically significant relationships he cited were from a survey study that was never submitted to a peer review. The other three statistically significant relationships were from supplemental tables of a mortality study, which are actually a comparison of the same

kidney cancer incidence in Camp Lejeune and Camp Pendleton, expressed in three different ways. Thus, plaintiffs have failed to prove that contaminated water at Camp Lejeune is capable of causing UTUC.

And then, finally, as to a specific causation, Mr. Mousser's specific causation, Dr. Del Pizzo failed to consider Mr. Mousser's full smoking history, so he was unable to perform a reliable differential diagnosis. Dr. Del Pizzo assumed that plaintiff last smoked in 2012, and then only a few cigarettes per day. However, at trial, the record shows that Mr. Mousser smoked a pack a week for one to five years prior to July 2020, within a few weeks of being diagnosed with cancer.

As opposed to Camp Lejeune water, smoking is a well-known cause of urothelial cancer, which Mr. -- which Dr. Del Pizzo failed to appropriately consider. Thus, plaintiff failed to offer any reliable differential diagnosis.

Thank you, Your Honor.

THE COURT: Thank you.

MR. ABRAMS: Your Honor, we've shown already that before Mr. Mousser got on base, the water was highly contaminated with solvents. One of those solvents is TCE. The Government agrees TCE causes kidney cancer. That's what Mr. Mousser has. He is exposed to a huge number of this substance, this solvent.

What it does, this solvent, it's so strong, so

powerful, you can -- you know, I try to get a fishing reel when it's stuck to get unstuck. This stuff can get grease on the inside of an engine off. He was drinking that day after day after day after day for 571 days at the height of the exposure.

They agreed that stuff causes kidney cancer. The Government spent $300 million to clean up this base to get rid of this kidney-cancer-causing solvent that's in the water. They studied this. The Government studied it. They want you to ignore all the studies that the Government did that find that at the levels at Camp Lejeune, this stuff causes kidney cancer. And Mr. Mousser was there at the very height of the exposure.

And then you've heard from a doctor who's looked at everything. He looked at the smoking history. He said it doesn't come anywhere close. He assumed the height. He assumed everything they're saying about smoking. He said it doesn't come close. We've proven causation, Your Honor. We've proven damages.

Thank you.

THE COURT: All right. I'll deny the motion under Rule 52 at this time. It is Rule 52, right?

MR. ANWAR: Correct. 52(c), Your Honor.

THE COURT: Yeah, okay. And the plaintiff has rested subject --

10:22:26 Here comes your witness. We'll reopen your evidence
10:22:36 for this witness. You got to get sworn --
10:22:48 MR. ABRAMS: You got to get sworn in real quick.
10:22:49 THE CLERK: Place your left hand on the Bible, raise
10:22:49 your right hand, and state and spell your name for the record.
10:22:49 THE WITNESS: C-H-A-D S-T-A-L-L-E-R, Chad Staller.
10:22:56 CHAD STALLER, J.D., M.B.A.,
10:22:58 was sworn at 10:22 a.m., and testified as follows:
10:22:58 DIRECT EXAMINATION BY MR. ABRAMS:
10:23:17 Q. Mr. Staller, what do you do for a living?
10:23:20 A. I'm a forensic economist.
10:23:23 Q. And please give Judge Boyle an overview of your
10:23:26 background.
10:23:28 A. Background, so I completed high school down in Rockville,
10:23:31 Maryland, just outside Washington, D.C. After high school, I
10:23:35 went to Beth -- Lehigh University in Bethlehem, Pennsylvania,
10:23:38 where I received my bachelor's of science degree in economics.
10:23:42 After Lehigh, I went to Temple University, to the Beasley
10:23:45 School of Law, where I received my juris doctorate, graduating
10:23:48 with honors in 2001.
10:23:51 A few years later, I returned to Temple University to the
10:23:55 Fox School of Business, where I received my MBA, graduating
10:23:58 with honors in 2005. I went a little further west to Villanova
10:24:03 University, where I received a master's of accountancy degree
10:24:06 in 2006. In addition to my matriculated degrees, I hold a CVA,

10:24:11 a Certified Valuation Analyst, designation from the
10:24:16 organization NACVA, N-A-C-V-A, the National Association of
10:24:20 Certified Valuation Analysts.
10:24:22 By way of background, I did practice law for roughly four
10:24:26 years after completing my MBA, which I did at night. In 2005,
10:24:32 I joined my current employer, The Center for Forensic Economic
10:24:36 Studies, which is based in Philadelphia, Pennsylvania, where
10:24:39 I've been a forensic economist since 2005.
10:24:44 THE COURT: All right.
10:24:44 MR. ABRAMS: Your Honor, we would tender Mr. Staller
10:24:46 as an expert in economics and in calculating lost earnings and
10:24:50 future costs.
10:24:51 THE COURT: The Court will accept the witness as an
10:24:53 expert in that field and allow him to express his opinions.
10:24:58 Q. Mr. Staller, what did you do in this case?
10:25:00 A. In this case, I evaluated the lost economic benefits from
10:25:06 continued work for Mr. Mousser, as well as the present value
10:25:10 cost of future medical care for Mr. Mousser.
10:25:12 Q. So in simple terms, you figured out if he had stayed
10:25:16 working and hadn't had to leave work because of his issues
10:25:20 caused by Camp Lejeune, how much more money he would have made,
10:25:23 and you did that in a present value, right?
10:25:28 A. Yes. So my calculations -- now, Mr. Mousser, being a
10:25:31 little mature in age, present value is a limited part because
10:25:35 that's only beyond years 2026. But, yes, any future years are

10:25:38 reduced to present value. His cost of future medical care, as
10:25:42 presented by Mr. Fryar, has been reduced to present value.
10:25:46 Q. Okay. And so your report is Plaintiff's Exhibit 128.
10:25:50 That's right, isn't it? You've seen it. It's --
10:25:52 A. I've seen my report, yes. I see my reports, yes.
10:25:54 MR. ABRAMS: We move to introduce Mr. Staller's
10:25:56 report into evidence, Your Honor.
10:25:58 THE COURT: What's that?
10:25:59 MR. ABRAMS: We move his report into evidence.
10:26:01 THE COURT: Received.
10:26:02 (Plaintiff's Exhibit Number 127 received.)
10:26:02 MR. ABRAMS: That's Exhibit 1 -- Plaintiff's Exhibit
10:26:05 128, and your CV is Plaintiff's Exhibit 130. We would move
10:26:08 that into evidence as well.
10:26:08 THE COURT: Received.
10:26:08 (Plaintiff's Exhibit Number 130 received.)
10:26:08 MR. ABRAMS: Oh, I misspoke. His report is 127, Your
10:26:16 Honor.
10:26:16 THE COURT: All right.
10:26:16 Q. (By Mr. Abrams) For lost earnings, what's your total
10:26:24 calculation of lost earnings in this case?
10:26:29 A. Lost earnings is -- your colleague has my glasses. I
10:26:32 actually -- I actually need my glasses.
10:26:33 Q. I can tell you. Is it $305,101?
10:26:38 A. Yes.

10:26:38 MR. DOWLING: May I approach, Your Honor?
10:26:39 THE COURT: Yes.
10:26:45 THE WITNESS: Thank you so much.
10:26:46 A. Yes. That is correct.
10:26:53 Q. And so if he had not had to leave work, he'd have 305,101 additional dollars?
10:26:59 A. Correct. Through his statistical work life of age 65.6, which will be in the year 2028, correct.
10:27:01 Q. So you didn't run it out to 67. You assumed that he was going to stop at 65?
10:27:07 A. Initially, I did two models. But, yes, if we're going with just his statistical work life, that would be just to his age 65.6, which would then total $305,101.
10:27:11 Q. And then for future care, you have two scenarios. One where he needs a transplant. What's the future -- the cost of his future care, assuming Dr. Cooper is correct that he'll need a transplant?
10:27:14 A. That he will need a transplant?
10:27:16 Q. Yes.
10:27:20 A. Yes. With a transplant, in present value terms, that's $902,874.
10:27:26 Q. Is it -- I think it's 800 --
10:27:30 A. Eight-hundred and -- yes. My -- it's dark in here.
10:27:35 Q. So for the -- just for the record, it's $802,874 of future care. That's future medical care?
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10:27:41
10:27:42
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10:28:08 A. Yes.
10:28:14 Q. And if he doesn't -- if he's unable to get a transplant
10:28:17 but he stays on dialysis, it's about $25,000 less?
10:28:22 A. Yes, $777,255.
10:28:28 Q. And you've done a report, a rebuttal report and a
10:28:31 supplemental report. I want to make sure I get each of those
10:28:34 into evidence.
10:28:34 MR. ABRAMS: Your Honor, those are Exhibits 126, 127
10:28:38 and 128. We'd move all three of his reports into evidence.
10:28:41 THE COURT: Received.
10:26:02 (Plaintiff's Exhibit Numbers 126 and 128
10:26:02 received.)
10:28:43 Q. And so the bottom line is if this man needs a transplant,
10:28:49 which Dr. Cooper says he will, and if he had to leave work
10:28:56 because of his kidney cancer and the resulting medical issues,
10:29:00 he has suffered approximately $1.1 million in economic harm; is
10:29:05 that right?
10:29:06 A. That is correct.
10:29:07 MR. ABRAMS: Thank you.
10:29:09 THE COURT: Cross?
10:29:10 MR. CROMWELL: Yes, Your Honor, briefly. Just for
10:29:14 the record, my name is Michael Cromwell, and I represent the
10:29:15 United States.
10:29:17 CROSS-EXAMINATION BY MR. CROMWELL:
10:29:17 Q. Mr. Staller, good to see you again.

10:29:19 A. Nice to see you again.
10:29:20 Q. I'll touch on the opinions you just offered in a moment,
10:29:24 but I want to make clear the scope of your opinions that you're
10:29:27 offering here. So you are offering an opinion with regards to
10:29:31 Mr. Mousser's lost earning capacity, correct?
10:29:35 A. What he would have made if he continued to work as a sales
10:29:38 manager, yes.
10:29:38 Q. You've identified that as the title of "Lost Earning
10:29:40 Capacity," right? That is the category being used?
10:29:44 A. That's the title of my report, yes.
10:29:45 Q. Okay. And the second one is the present value of his
10:29:49 future medical care, correct?
10:29:51 A. Yes.
10:29:51 Q. Okay. You're not offering an opinion here today with
10:29:55 regards to any lost or past household services, correct?
10:29:59 A. True.
10:29:59 Q. You are not offering any opinions regarding any past
10:30:03 medical expenses incurred by Mr. Mousser, correct?
10:30:07 A. True.
10:30:08 Q. You're also not offering any opinion with regards to the
10:30:12 reasonable value of any past medical expenses that Mr. Mousser
10:30:16 may have incurred, correct?
10:30:18 A. No opinion on the reasonableness of past expenses.
10:30:23 Q. Okay. You also have offered no opinions regarding any of
10:30:26 the offsets that the Government may -- the Government may be

10:30:29 seeking in this case, correct?
10:30:31 A. I have not.
10:30:32 Q. Okay. For instance, you're not offering an opinion
10:30:34 regarding the value of any past or future medical care that the
10:30:38 United States may provide or has provided to Mr. Mousser,
10:30:41 correct?
10:30:43 A. I have not valued that.
10:30:44 Q. Okay. And the same thing, you haven't valued anything
10:30:46 with regards to disability benefits that the United States has
10:30:50 paid or will provide to Mr. Mousser, correct?
10:30:55 A. I have not calculated that, true.
10:31:01 Q. Now, Mr. Staller, in formulating your opinions, you didn't
10:31:06 have any communications with Mr. Mousser, correct?
10:31:09 A. That's true.
10:31:10 Q. You didn't interview him or ask about his conditions,
10:31:12 correct?
10:31:13 A. I did not.
10:31:15 Q. Okay. You also never had any communications with
10:31:17 Mr. Mousser's treating physicians, right?
10:31:21 A. True.
10:31:21 Q. Okay. So a lot's been made in this case about future
10:31:27 calculations, or will be, and I want to talk about some
10:31:32 assumptions that you've made with regards to future medical
10:31:36 care, as well as the future lost earning capacity, the two
10:31:39 opinions you've offered, okay?

10:31:40 A. Sure.
10:31:41 Q. So let's start with your plans on future medical care.
10:31:45 A. Okay.
10:31:46 Q. Just to be clear, you're offering simply a present value
10:31:50 of Mr. Mousser's proposed future care, correct?
10:31:53 A. True.
10:31:53 Q. And you're relying on the cost estimate opinion of
10:31:58 Mr. Fryar, correct?
10:32:00 A. That is true.
10:32:02 Q. And just to be clear, Mr. Fryar sets out the type of care
10:32:06 he opines on that Mr. Mosser may need in the future, right?
10:32:11 A. He does.
10:32:12 Q. And he ascribes a value to what that care may cost in the
10:32:16 future, correct?
10:32:19 A. In part. He ascribes a base year cost to those items and
10:32:23 then the frequency of those items to be incurred each year and
10:32:25 then the duration of those items. Future costs, ultimately,
10:32:28 would be accounting for the inflation and present value. So he
10:32:32 gives base year and then other inputs to do a future lifetime
10:32:37 cost.
10:32:38 Q. Understood. Understood. But with regards to those base
10:32:43 costs and frequency and the type of care, you're entirely
10:32:47 relying upon Mr. Fryar, correct?
10:32:50 A. Yes, for the items that Mr. Mousser may need, I'm relying
10:32:53 upon Mr. Fryar's opinions on what Mr. Mousser may need.

10:32:57 Q. Okay. And in doing so, you are assuming, for purposes of
10:33:01 your calculations that you've offered, that the medical
10:33:04 treatment identified by Mr. Fryar will not change or be altered
10:33:08 in the future, correct? That's not what your calculations are
10:33:11 based upon?
10:33:13 A. I don't understand that question.
10:33:14 Q. Sure. Your calculations are based upon present day what
10:33:18 Mr. Fryar opines on what Mr. Mousser will need in the future,
10:33:22 correct?
10:33:23 A. Yes, it's based upon Mr. Fryar's investigation, his
10:33:27 expertise as a life care planner, and building a plan that he
10:33:30 believes to a reasonable degree of life care planning certainty
10:33:34 of the needs for Mr. Mousser over his life expectancy.
10:33:37 Q. Right. So your assumptions, though, you're -- for
10:33:40 purposes of your calculation, you're assuming that's the care
10:33:42 he'll need in the future, right?
10:33:44 A. That's true.
10:33:49 Q. Okay. Additionally, in order to offer your opinions on
10:33:51 the cost of Mr. Mousser's future medical care, you calculated
10:33:56 those costs based upon his life expectancy, right?
10:34:01 A. Statistical life expectancy, yes.
10:34:03 Q. And, specifically, when determining the value of
10:34:06 Mr. Mousser's future medical care, you calculated the value
10:34:10 from January 1, 2029, through the age of 75, right, future
10:34:14 duration?

10:34:17 A. For future medical care?
10:34:18 Q. Correct.
10:34:22 A. To what age?
10:34:23 Q. Age 75.
10:34:25 A. Yes. Correct.
10:34:25 Q. Okay. And you based your statistical life expectancy opinions based off tables that are created by the National Center for Health Statistics, correct?
10:34:36 A. Yes.
10:34:37 Q. Those are maintained by the CDC, the Centers for Disease Control?
10:34:39 A. They are.
10:34:41 Q. And that's a source you typically rely upon as a forensic economist, correct?
10:34:46 A. Yes.
10:34:47 Q. This is actually one of the areas in which you and the United States' forensic economist, Tricia Yount, agree upon, right?
10:34:55 A. Agree upon the validity of the United States Life Tables?
10:34:57 Q. Yes.
10:34:58 A. That's one area that we agree upon. There's others.
10:35:00 Q. It's a familiar -- correct. We'll get to some of those, but that's one of the areas, correct?
10:35:02 A. Yes.
10:35:04 Q. Okay. And your typical practice involves you relying on
10:35:06

10:35:10 statistical life expectancy tables when forming your opinions
10:35:13 in personal injury cases such as this, correct?
10:35:17 A. Yes.
10:35:17 Q. Okay. So it's fair to say that it is normal and standard
10:35:22 methodology in forensic economists to rely on life expectancy
10:35:26 in formulating future economic damage calculations, right?
10:35:31 A. When we don't have specific life expectancy opinions, yes.
10:35:34 Q. So without that, you agree that's the standard
10:35:37 methodology, though?
10:35:38 A. Yes. Absent the guidance from a trained medical
10:35:41 professional or a life care planner, then, yes, the standard
10:35:43 practice is to defer to the United States Life Tables.
10:35:46 Q. Okay. In offering your opinion about Mr. Mousser, you are
10:35:53 aware that he could live beyond his life expectancy, correct?
10:35:59 That's one possibility?
10:36:02 A. Yes. There's -- there's three options. One option is to
10:36:04 go beyond a measured period of life expectancy.
10:36:07 Q. So just -- I'll break it apart. I'm not -- I'm not trying
10:36:10 to mislead you.
10:36:10 A. Okay.
10:36:10 Q. So one of the options is that Mr. Mousser could live
10:36:14 beyond his life expectancy, correct?
10:36:16 A. True.
10:36:17 Q. And another possibility, as you just mentioned, is that he
10:36:20 could pass away before his life expectancy, correct?

10:36:22 A. True.
10:36:24 Q. And the last one, which I think you were alluding to, is
10:36:26 that he could pass away at the exact moment of his life
10:36:30 expectancy, correct?
10:36:32 A. That's true, yes.
10:36:33 Q. Okay. So when you use a person's life expectancy to
10:36:38 calculate the value of a plaintiff's life care plan, you'd
10:36:42 agree there are essentially three outcomes, correct?
10:36:45 I'll break it down. You agree that a person could be
10:36:50 overcompensated if they passed away before or after their
10:36:53 statistical life expectancy, correct?
10:36:57 A. There would be excess funds if one does -- succumbs before
10:37:01 the measured duration period to the life expectancy, yes.
10:37:04 Q. Okay. So is the -- all right. Is the answer to my
10:37:06 question yes?
10:37:06 A. Yes.
10:37:07 Q. Okay. And a person could be overcompensated because they
10:37:12 passed away before their life expectancy, correct?
10:37:15 A. Yes.
10:37:17 Q. And, lastly, just based off the three scenarios, a person
10:37:19 could be equally -- or receive the estimated value because they
10:37:23 passed away at the time of their life expectancy, right?
10:37:29 A. Estimated value, yeah, the value calculated.
10:37:30 Q. Right.
10:37:30 A. Yes.

10:37:35 Q. Okay. And that's why a forensic economist such as
10:37:37 yourself tend to go with the central tendency, right? This is
10:37:40 the mean or median point of survival, right?
10:37:43 A. On a bell curve, right, that's the meaty part of the
10:37:47 curve, yes.
10:37:47 Q. Okay. And the fact that an individual plaintiff may pass
10:37:52 away before their life expectancy does not render your
10:37:56 calculations unreasonable or speculative, right?
10:37:59 A. I agree with that.
10:38:01 Q. And the fact that an individual plaintiff may pass away
10:38:03 after their statistical life expectancy doesn't render your
10:38:07 calculations unreasonable or speculative, correct?
10:38:10 A. I agree with that.
10:38:12 Q. In formulating your opinions, you agree you did not
10:38:16 account for this variability in life expectancy, right, the
10:38:19 fact that an individual like Mr. Mousser may pass away or --
10:38:24 before or after his life expectancy, correct? That's not
10:38:28 something you do in part of your practice, right?
10:38:31 A. Well, I think that would require a crystal ball, and we
10:38:33 don't have that, so the best we could do is either get specific
10:38:36 opinions from trained medical professionals that use their
10:38:39 expertise to opine on duration. Absent that, it is to use the
10:38:43 United States Life Tables, like you mentioned. When you use
10:38:45 life expectancy, that is from the tables. That's the mean
10:38:48 period. So there's a population that lives beyond it, but this

10:38:51 is where 50 percent would succumb.
10:38:53 Q. Right. Your practice is to build models for future
10:38:57 medical care, right? That's what you do?
10:38:59 A. In certain cases, and in this case, yes.
10:39:01 Q. That's my follow-up. You did that for Mr. Mousser's case,
10:39:03 right?
10:39:03 A. Yes.
10:39:07 Q. Okay. The fact that you don't opine on this variability,
10:39:10 though, doesn't render your methods or conclusions unreliable,
10:39:14 right?
10:39:14 A. I still agree with that.
10:39:18 Q. Okay. Mr. Staller, you also made some assumptions about
10:39:23 certain variables when you were calculating Mr. Mousser's lost
10:39:26 earning capacity, and I want to talk about one or -- one of
10:39:26 them.
10:39:30 Specifically, you tied your lost earning capacity
10:39:33 opinion -- you've offered what is known as earning growth
10:39:38 opinion, right, how much Mr. Mousser's wages would change in
10:39:41 the future over time, right?
10:39:43 A. Yes, wage growth.
10:39:45 Q. Okay. And just so everyone's clear, earnings growth is
10:39:47 simply how much a particular wage will change over time in the
10:39:51 future, right?
10:39:54 A. Earnings growth -- well, not over time, but increases,
10:39:56 right? There could be deflation or wage recession technically.

10:40:00 But, yes, earnings growth is particularly just the increase of
10:40:03 wages over time to account for the changing price of goods and
10:40:06 services one has to acquire.
10:40:08 Q. Okay. When you're calculating future growth of earnings,
10:40:13 you are estimating what the future growth of a wage might be
10:40:17 per year for plaintiff's remaining work life expectancy, right?
10:40:21 A. Yes.
10:40:21 Q. Okay. And I think you opined before that you estimated
10:40:24 his work life expectancy to be 65.8 years; is that right?
10:40:29 A. His work life expectancy?
10:40:30 Q. Yes.
10:40:30 A. Yes.
10:40:32 Q. Okay. I apologize. Just for the record, I think it was
10:40:35 65.6.
10:40:35 A. Oh.
10:40:35 Q. Just for the record.
10:40:40 A. 65.6 is his statistical work life, yes.
10:40:43 Q. Okay. And future growth is based upon, for instance, a
10:40:47 specific person's occupation in part, right, what kind of job
10:40:50 they had?
10:40:51 A. In part.
10:40:53 Q. Just so we can explain this to the Court, right, the wage
10:40:56 of a pilot may be different than the wage of somebody who works
10:41:01 as --
10:41:01 THE COURT: How many more --

10:41:01 Q. -- as a cashier?
10:41:01 THE COURT: How many more questions are you going to have? Because this is going on ad nauseam.
10:41:06 MR. CROMWELL: I understand, Your Honor. I don't have much --
10:41:07 THE COURT: No, you don't understand.
10:41:08 MR. CROMWELL: I apologize, Your Honor?
10:41:08 THE COURT: You don't understand.
10:41:11 MR. CROMWELL: Okay. I understand, Your Honor. I do, but there are important -- there are important issues in regards to --
10:41:16 THE COURT: It's not that material.
10:41:18 MR. CROMWELL: Your Honor, throughout -- I apologize. Throughout this litigation --
10:41:21 THE COURT: This is a ruling. You don't get to argue about a ruling.
10:41:26 MR. CROMWELL: I'm sorry. If you -- forgive me, what's -- what is your ruling? I apologize, Your Honor.
10:41:29 THE COURT: My ruling is that you need to wrap this up.
10:41:32 MR. CROMWELL: And I will do so, Your Honor. There are important points here about --
10:41:36 THE COURT: I'm not seeing any important points.
10:41:39 MR. CROMWELL: Plaintiffs have made numerous --
10:41:40 THE COURT: I understand you can die at any time,

10:41:42 that your life expectancy isn't within your control.
10:41:45 MR. CROMWELL: Right.
10:41:45 THE COURT: Okay, so that's it.
10:41:48 MR. CROMWELL: Well, there are certain assumptions
10:41:49 that --
10:41:49 THE COURT: I'm not going to argue with you. You can
10:41:50 sit down.
10:41:54 MR. CROMWELL: I understand, Your Honor. May I
10:41:54 finish my questioning, Your Honor?
10:41:55 THE COURT: I'm the trier of fact. Do you really
10:41:57 want to engage in debate with me?
10:41:59 MR. CROMWELL: I don't. I thought you were asking
10:42:00 for a response, Your Honor.
10:42:02 THE COURT: No, I'm not.
10:42:02 MR. CROMWELL: Okay.
10:42:02 THE COURT: I'm giving you some guidance.
10:42:07 MR. CROMWELL: I understand, Your Honor.
10:42:09 THE COURT: You can reject it.
10:42:10 MR. CROMWELL: I understand, Your Honor. I do. I
10:42:12 promise.
10:42:12 Q. (By Mr. Cromwell) Mr. Staller --
10:42:21 THE COURT: Let's take a recess and then you can
10:42:23 reassess what you're doing. This was a call-on witness. We've
10:42:26 already had the Rule 52 motion hearing, so it's ready for your
10:42:32 time to put on evidence. We'll take a 10-minute recess.

10:42:35 (A recess was taken from to 10:42 a.m. to 10:53 a.m.)
10:42:35 THE COURT: You can continue with your cross.
10:53:18 MR. CROMWELL: Thank you, Your Honor.
10:53:22 Q. (By Mr. Cromwell) Mr. Staller, we were talking about
10:53:25 assumptions with your calculation. I just have one more area,
10:53:29 and I'm done.
10:53:29 A. Sure.
10:53:29 Q. In reaching your earning capacity opinion, you relied in
10:53:36 part on the January 26, 2024, report of plaintiff's vocational
10:53:41 expert, Kelly Sakala, correct?
10:53:46 A. Not to measure Mr. Mousser's earnings, but on residual
10:53:50 capacity.
10:53:50 Q. And by "residual capacity," you mean that whether he could
10:53:53 actually be employed going into the future or not at any level,
10:53:57 correct?
10:53:57 A. True.
10:53:58 Q. Okay. Having reviewed her report, you understand that
10:54:04 plaintiff's expert, Ms. Sakala, offered -- when she offered her
10:54:09 vocational opinions about Mr. Mousser's ability to work, she
10:54:12 made certain assumptions when issuing her report, correct?
10:54:23 A. I don't have her report in front of me. Obviously, she
10:54:25 makes certain vocational conclusions. I don't remember what
10:54:30 assumptions she would have made.
10:54:31 Q. Understood.
10:54:32 MR. CROMWELL: Your Honor, may I approach?

10:54:33 THE COURT: Sure.
10:54:52 MR. CROMWELL: For the record, this is U.S. Exhibit 2009.
10:54:54 Q. This is a copy of Ms. Sakala's January 26, 2024, report; is that correct?
10:54:56 A. It is.
10:55:01 Q. And this is the same report you relied upon, correct?
10:55:02 A. It is.
10:55:06 Q. Okay. If you would, Mr. Staller, turn to page 4 of her report, and there's a section entitled "Vocational Evaluation of Assumptions." Do you see that about halfway down the page?
10:55:09 A. I see it, yes.
10:55:13 Q. And she notes, "The vocational opinions regarding Mr. Mousser's employability and vocational rehabilitation potential expressed in this report are based on the assumptions that," and then she lists six assumptions, correct?
10:55:18 A. She does.
10:55:22 Q. And if you look at the sixth assumption on page 5, she assumes that, "Mr. Mousser's service-connected physical and emotional impairments and reduction of vocational capacity are permanent." I read that correctly?
10:55:30 A. Yes.
10:55:33 Q. Okay. So you understand that Ms. Sakala offered -- in offering her expert opinion, she made assumptions about Mr. Mousser's service-connected impairments remaining

10:56:11 permanent, correct?
10:56:14 A. Yes.
10:56:15 Q. Okay. And then you mentioned before in the previous
10:56:18 question that you don't have a crystal ball, right?
10:56:22 A. True.
10:56:22 Q. And you would agree with me that it is common practice for
10:56:25 an economist such as yourself to make certain assumptions about
10:56:28 what may occur in the future, right?
10:56:32 A. We have to -- when we're building models that go beyond
10:56:35 the present year, we have to make assumptions, yes.
10:56:37 Q. Okay. And you would agree with me that even though events
10:56:41 in the future may change some of the variables you rely upon
10:56:45 for your calculations, it does not render your future
10:56:49 calculations unreliable respectively, right?
10:56:53 A. No, the standard is not 100 percent certainty. It's to a
10:56:56 reasonable degree of economic certainty, and that entails using
10:56:59 the best data available, the best information we have, reliable
10:57:02 data in the current year to build models to a reasonable
10:57:05 degree, not absolute certainty.
10:57:07 Q. Okay. So the question -- the answer to my question would
10:57:09 be yes, then?
10:57:10 A. Yeah, with that explanation, yes.
10:57:12 Q. Understood.
10:57:12 MR. CROMWELL: No further questions, Your Honor.
10:57:15 MR. ABRAMS: Your Honor, I think just maybe three

10:57:18 questions. The first one -- I guess, first, we would move to
10:57:23 introduce this exhibit they just handed up. I've marked it as
10:57:28 Plaintiff's Exhibit 121. It's the Employability Evaluation.
10:57:32 It's an expert that says he's unemployable. We'd move to
10:57:35 introduce that into evidence, Your Honor. It's the document
10:57:37 they just showed him.
10:57:38 THE COURT: It'll be received.
10:57:38 (Plaintiff's Exhibit Number 121 received.)
10:57:38 MR. ABRAMS: And then I want to make sure that Your
10:57:43 Honor understands, and I'll --
10:57:45 REDIRECT EXAMINATION BY MR. ABRAMS:
10:57:45 Q. Mr. Staller, I'll get you to make sure I'm right here.
10:57:50 You have calculated the total cost of Mr. Mousser's future care
10:57:57 based on what a transplant surgeon says he's going to need; is
10:58:00 that right?
10:58:01 A. That's true.
10:58:02 Q. And you also assumed -- you compared Mr. Mousser's
10:58:11 statistical life expectancy, which is over 85 years old, right?
10:58:15 A. Yes. Statistical life expectancy for Mr. Mousser and his
10:58:18 demographics, 85 and change, yes.
10:58:20 Q. But the doctor who looked at Mr. Mousser's record finds
10:58:24 that he's going to die ten years early, right?
10:58:26 A. Unfortunately, he had a reduced life expectancy, yes.
10:58:32 Q. And your ultimate opinion is that based on the future care
10:58:37 that he's going to need and the amount of money that he lost

10:58:41 because he can't work anymore, he suffered $1.1 million of
10:58:45 economic loss?
10:58:46 MR. CROMWELL: Your Honor, I have to object at this
10:58:46 point. This is pretty repetitive, leading.
10:58:50 THE COURT: Can't hear you.
10:58:51 MR. CROMWELL: Sorry, Your Honor. I just have to
10:58:52 object to the leading nature of these questions.
10:58:55 THE COURT: Overruled.
10:58:58 A. Yes. Assuming a reduced life expectancy to age 75 for
10:59:01 Mr. Mousser, with loss earnings, it's $1.1 million in economic
10:59:05 loss.
10:59:05 MR. ABRAMS: Thank you. No further questions.
10:59:09 THE COURT: All right. You can step down.
10:59:11 THE WITNESS: Thank you, Your Honor.
10:59:12 (The witness exits the witness stand at 10:59 a.m.)
10:59:12 THE COURT: You've already rested, so --
10:59:13 MR. ABRAMS: Yes, Your Honor.
10:16:43 THE COURT: -- this was an added witness who couldn't
10:59:17 find his way here.
10:59:19 MR. ABRAMS: Yes, Your Honor.
10:59:19 THE COURT: All right.
10:59:19 MR. ABRAMS: Thank you.
10:59:20 (The plaintiff rests his case.)
10:59:21 THE COURT: And I've denied the motion under Rule 52,
10:59:23 so do you have any evidence you want to offer?

10:59:28 MR. BAIN: Yes, Your Honor. We call Dr. Peter
10:59:30 Shields to the witness stand.
10:59:31 THE CLERK: Place your left hand on the Bible, raise
10:59:31 your right hand, and state and spell your name for the record.
10:59:31 THE WITNESS: Peter Gary Shields, P-E-T-E-R G-A-R-Y
10:59:31 S-H-I-E-L-D-S.

PETER GARY SHIELDS, M.D.,

10:59:57 was sworn at 10:59 a.m., and testified as follows:
10:59:57 DIRECT EXAMINATION BY MR. GUYNN:
11:00:32 Q. Good morning, Dr. Shields.
11:00:35 A. Good morning.
11:00:38 Q. My name is Jonathan Guynn. I represent the United States
11:00:41 in this case.
11:00:41 Dr. Shields, would you please introduce yourself to the
11:00:45 Court?
11:00:46 A. Sure. My name is Peter Shields. I'm a physician
11:00:48 scientist at Ohio State University, Columbus, Ohio. I'm a
11:00:50 treating cancer physician, as well as my research expertise has
11:00:56 been in carcinogenesis, epidemiology and causes of cancer.
11:01:02 Q. Did the United States ask you to determine whether there
11:01:05 is scientific evidence that TCE, PCE, benzene, vinyl chloride,
11:01:11 or a combination of those chemicals can cause kidney cancer?
11:01:14 A. Yes.
11:01:15 Q. Did the United States ask you to evaluate whether
11:01:18 Dr. Hatten's general causation report and the opinions he is

11:01:22 offering are reliable in this case?
11:01:23 A. Yes.
11:01:24 Q. Did you do what was necessary to conduct both of those
11:01:28 analyses?
11:01:29 A. Yes.
11:01:30 Q. Are you prepared to tell us what you did, why you did it,
11:01:33 and what conclusions you've reached?
11:01:35 A. Yes.
11:01:36 Q. Okay. Before we get to your general causation analysis
11:01:39 and your critiques of Dr. Hatten's methodology, let's review
11:01:42 the education and training that you received to become a
11:01:46 specialist. Would you please summarize your educational
11:01:48 background for the Court?
11:01:50 A. Sure. So starting in college, I went to the University of
11:01:52 Pennsylvania, where I double-majored in biochemistry and
11:01:56 American civilization, which is anthropology applied to
11:02:01 American history. From there, I went to medical school in New
11:02:05 York City, Mount Sinai School of Medicine. That's where I
11:02:07 actually got interested in occupational and environmental
11:02:10 health. That institution was really the real founders of
11:02:15 modern occupational medicine. From there, I continued my
11:02:20 training to go into internal medicine at George Washington
11:02:23 University in Washington, D.C., where I continued some of the
11:02:27 training in occupational environmental medicine.
11:02:29 I had a gap year while I was deciding to go into medical

11:02:35 oncology, and so I did a full-time practice in occupational
11:02:38 environmental medicine, and then I did an oncology fellowship
11:02:42 as a combined fellowship at George Washington University
11:02:46 Hospital, as well as the National Cancer Institute. The NCI is
11:02:51 the largest research cancer institute in the world.
11:02:54 Q. All right. Dr. Shields, just -- I'm having a hard time
11:02:57 hearing you over here. Can you make sure that you project
11:02:59 so --
11:02:59 THE COURT: I'm hearing him good. This is anomalous
11:03:00 here. I haven't heard anything you-all are saying, but he's
11:03:06 fine, so leave him alone.
11:03:08 MR. GUYNN: Okay.
11:03:08 Q. I apologize, Dr. Shields. Okay, you mentioned oncology.
11:03:13 Can you please describe to the Court, what is oncology?
11:03:17 A. So oncology in the strictest sense is a discipline that --
11:03:21 it's physicians that take care of cancer patients, diagnosis
11:03:26 and treatment. More broadly, as a lot of oncologists,
11:03:31 especially in universities, I also have other, you know, focus.
11:03:35 It could be cancer survivorship. I look at causes of cancer.
11:03:39 It could be artificial intelligence applied to imaging. So
11:03:43 oncology is pretty broad, but by the strict sense, it's care of
11:03:46 cancer patients.
11:03:47 Q. Okay. Now, you're -- you also have training in
11:03:50 epidemiology. Can you tell the Court, what is the field of
11:03:53 epidemiology?

11:03:55 A. So epidemiology is a science that basically asks the
11:03:58 question, if something happens, does it cause some outcome? So
11:04:02 it could be wearing seatbelts, do you reduce deaths from car
11:04:08 accidents? As we're sitting here today, it's whether Camp
11:04:11 Lejeune levels of -- that were contaminating the drinking water
11:04:16 can cause kidney cancer. It's a science that's built up.
11:04:20 There's strict methodology. There's an -- you know, an
11:04:24 analytic part. There's an interpretation part.
11:04:28 Q. Okay. And you have training in toxicology. Can you
11:04:31 please tell the Court, what is the field of toxicology?
11:04:33 A. Yeah, so I don't have formal training in toxicology, but
11:04:36 I've conducted toxicology work. My research career is almost
11:04:39 40 years now. And so toxicology is trying to understand the
11:04:45 effect of an exposure, radiation, chemical, fiber -- and as
11:04:49 we're talking about today, it's chemical exposures -- on the
11:04:53 impact of the human body, animals, cells in Petri dishes. And
11:04:59 so a lot of my research has been in understanding the chemical
11:05:02 impact.
11:05:02 Quite frankly, most of it has been for smoking, which is a
11:05:06 great model for chemical carcinogenesis. I mean, people bathe
11:05:10 their lungs in cigarette smoke. But I've also done breast
11:05:13 cancer work and written many articles on this that includes the
11:05:18 toxicology. But one of the things we do is develop blood tests
11:05:22 so you can go to your doctor and say, hey, this makes you more
11:05:25 at risk of one type of cancer or another. So that's

toxicology.
Q. Okay. And you mentioned the word "carcinogenesis." Can you tell the Court, what is carcinogenesis?
A. So "carcino" is cancer. "Genesis" is beginning. So the focus of really what encompasses all of this is what happens in a cell in the body to get changed so that cell becomes sick and becomes cancer and then grows and grows and grows to cause clinical disease.
Q. Okay. Now, Dr. Shields, could you please summarize your professional history and just emphasize your experience in that, each of those specialty fields, along the way?
A. Sure. So after I did my postdoctoral fellowship training at the National Cancer Institute, I actually stayed there, continued my clinical care, taking care of cancer patients at George Washington University Hospital, but 80 percent of the time, roughly, I was conducting research. So I had a laboratory, an epidemiologic field staff, and we were basically trying to understand how chemicals affect cells to become cancer, how do we detect that and what could we do about it, so that was at the NCI.
So from there, I actually moved my research program for various reasons. I stayed in Washington, D.C., but I moved to Georgetown University, where I was able to have a broader research program, but also started helping with this -- Georgetown University is a Comprehensive Cancer Center -- with

their research directions. Initially, I was a program leader of cancer genetics and epidemiology. Then I was a Deputy Director of the Comprehensive Cancer Center.

What's important to understand is these Comprehensive Cancer Centers are these powerhouses of clinical care and research. In North Carolina, you're actually fortunate to have three of them, Wake Forest, University of North Carolina and Duke. And at these institutions, we have hundreds -- thousands of researchers and hundreds of superspecialists, medical oncologists.

And so I was at Georgetown. I was there for about ten years, and then for a variety of reasons, decided to move to Ohio State University. Not a surprise, Ohio State University thinks it's big. It is big. By any metric, compared to Georgetown, Ohio State was five to ten times larger and more impactful than Georgetown, even though Georgetown was really impactful. And I moved to Ohio State to be Deputy Director of the Cancer Center, as well as continue my clinical practice and my research program on the causes of cancer.

And then lastly, a few years ago, I decided to actually shed the research response -- the research administrator responsibilities. I technically retired, and then I got rehired the next day as a returning retiree, and I did that so I can change the way I did the administrative work at Ohio State. So I continued taking care of patients and continued my

research program. I mean, technically, that's a 50 percent appointment, but I certainly work more than 50 percent there.

Q. Okay. Dr. Shields, have you published any peer-reviewed research?

A. Yes, of course. So as a researcher, if you do research, you know, you -- we're professional communicators, so we have to publish and we have to put our -- you know, our data out there. So the way you publish is you do the research, analyze the research, write it up, submit it to a professional journal.

The professional journals do what's called peer review. So what an editor will do is say, hey, we're interested in this paper. Now, I'm going to send it out to experts in the field who will give me confidential comments about this paper. "It's God's gift to the world; it stinks; it could be better; here's how you improve it."

And so, overall, I have -- I publish papers almost every month. I have a very fortunate -- I'm very fortunate to have a very productive research career, great collaborators, great staff. And so all told, it's about 350 peer-reviewed papers over now almost 40 years.

Q. Dr. Shields, how can you know whether or not your peer-reviewed research is making an impact in these fields?

A. So that's really important because if you write it up, the journal accepts it, and people read it and they go, "Eh, nothing here," and they never cite it, then you've kind of

11:09:57 wasted your time.
11:09:57 So one of the metrics we use to understand how impactful
11:10:02 we are is how many times other researchers cite my papers.
11:10:08 So -- and there's metrics there, and it's used for lots of
11:10:10 different reasons. But one of the metrics is that my papers
11:10:13 have been cited literally about 32,000, 33,000 times.
11:10:18 Q. And does that number of citations put you in the top
11:10:22 99 percent of published researchers?
11:10:24 A. So as part of Google Scholar and the Web of Science,
11:10:28 that's one of the metrics that's -- that's available. And we
11:10:31 track it, because, you know, I'm proud of the work that I and
11:10:34 my collaborators have done.
11:10:35 Q. So I apologize. I meant to ask you, does that put you in
11:10:37 the top 1 percent of researchers?
11:10:40 THE COURT: I got it.
11:10:40 THE WITNESS: Yeah, I got it too.
11:10:44 Q. Okay. Have you been certified by any medical boards?
11:10:47 A. Yeah, so I hold my board certification in internal
11:10:51 medicine and medical oncology. I was boarded in hematology,
11:10:55 and for a variety of reasons, I just let that lapse. I'm still
11:10:59 boarded in medical oncology.
11:11:00 Q. And do you currently practice clinical oncology?
11:11:04 A. Yeah, so as I mentioned, these cancer centers, we're all
11:11:07 these superspecialists. So right now for the last -- at Ohio
11:11:11 State, I'm only doing lung cancer patients. There's 14 of us.

11:11:16 There's 12 that do just breast cancer and a bunch that do just
11:11:19 prostate cancer.
11:11:19 When I was at Georgetown University, for a variety of
11:11:22 reasons, I was focusing more on hematology, so I took care of,
11:11:26 you know, leukemia patients and lymphoma patients. At George
11:11:30 Washington, which was not a Comprehensive Cancer Center, so we
11:11:33 were more generalists, and back then I took care of everything
11:11:36 from leukemia to kidney cancer patients, bladder cancer
11:11:40 patients, breast cancer patients. It was really whatever, you
11:11:43 know, patients came in, they were just assigned to us, you
11:11:47 know, in a -- in order.
11:11:48 Q. Dr. Shields, in addition to your work as a research
11:11:51 scientist and clinician, do you also serve your community as a
11:11:55 paramedic?
11:11:56 A. So when I retired a few years ago, one of the things that
11:12:01 instigated me to do this 50 percent appointment was to return
11:12:04 to a passion that I had back in medical school and college when
11:12:08 I worked as an emergency medical technician. So I trained for
11:12:13 a couple of years, got licensed as a paramedic. You know, it's
11:12:15 not like because you're a doctor, you could just, you know, get
11:12:18 into an ambulance and work as a doctor. You have to -- as a
11:12:20 paramedic, you have to think differently. You have different
11:12:22 skills. You have different tools. And so, you know, typically
11:12:27 now I do a 24-hour shift at the firehouse about once a week.
11:12:32 Q. Okay. Dr. Shields, I want you now to tell the Court about

11:12:34 any awards, recognitions or professional associations that you
11:12:38 have in the specialized fields we've discussed. So are you a
11:12:41 member of any professional organizations in these fields?
11:12:43 A. Yeah, a bunch. Because carcinogenesis is so broad,
11:12:48 epidemiology, toxicology, environmental health, I'm probably a
11:12:54 member of about a half a dozen different associations. Now, to
11:12:57 get to be a member of a professional association, it's not like
11:13:00 AARP or AAA where you send your money in and you're accepted.
11:13:04 This you have to send in credentials and they review it.
11:13:07 So I'm a member of the American Association of Cancer
11:13:09 Research, the American Society of Clinical Oncology, the
11:13:13 American College of Occupational Environmental Medicine, the
11:13:17 American College of Epidemiology, where there's a specific --
11:13:20 specific title that I have there.
11:13:22 I mean, I've been on the board of directors until
11:13:24 recently, but they also give an honorific title based on your
11:13:30 contributions to science. I don't have a Ph.D. in
11:13:33 epidemiology, but -- and most of the people in that American
11:13:36 College of Epidemiology are Ph.D.s. So they look at my
11:13:40 credentials and say, yeah, you're actually part of this club
11:13:42 because you've made impacts, so I'm a Fellow in the American
11:13:44 College of Epidemiology. I'm also a member of the American --
11:13:47 not the American -- the Society of Toxicology, American Society
11:13:53 of Preventive Oncology, and I'm sure I'm forgetting one or two,
11:13:57 but it's pretty broad.

I mean, we go to these meetings to network, to learn about the latest science before publications, and to present our science so we can get feedback from folks. Sometimes it can be brutal, sometimes it's very crazy, and sometimes they say, hey, we'd like to collaborate with you.

Q. But, Dr. Shields, you actually left one out that I think might be of particular interest in court. Are you a member of the American Conference of Governmental Industrial Hygienists?

A. Correct. I've been -- so what that is, is a organization that -- that is about exposures in the workplace, how to -- how to mitigate them, how to evaluate them. I'm not an industrial hygienist, but I've been a member. And, actually, recently I've been appointed to one of their high-level committees that's assessing exposures inside the body.

So if a worker is exposed to benzene or exposed to trichloroethylene, there's urine tests that you can do to confirm that your workplace exposures are being controlled and that the workers are not being overexposed for whatever reason.

Q. And then wrapping up this brief part of the examination, Dr. Shields, have you ever been qualified as an expert witness in a court of law?

A. I have. Probably -- I testified in a couple of cases, like, 1987 during my gap year. And then when I worked for the federal government, I wasn't allowed to do that, so when I got out of the federal government in 2000, I started ramping up on

this work again. And I've probably testified now in maybe a hundred different cases over the last 25 years.
Q. Have you testified as an expert for both plaintiffs and defendants in these types of cases?
A. I have. For the last several years, it's been entirely for defense, but I've done a lot of work in litigation against the tobacco industry, working for state -- state Attorneys General. My very, very first case was for a plaintiff who had a mesothelioma from asbestos exposure. That was back -- going back as early as 1987.
Q. Okay.
MR. GUYNN: Your Honor, the United States tenders Dr. Peter Shields --
THE COURT: I tried those asbestos cases.
THE WITNESS: Yeah, they've been around for a while. Sorry. Yeah.
MR. GUYNN: Okay. Your Honor -- and I apologize for the interruption -- Your Honor, the United States tenders Dr. Peter Shields as an expert witness in the fields of oncology, epidemiology, toxicology and carcinogenesis.
THE COURT: He's accepted as an expert in all those fields and allowed to express his opinions.
Q. All right. Dr. Shields, what were you asked to do in this case?
A. So I was asked to understand the potential exposures at

11:16:42 Camp Lejeune, come up with opinions and conclusions about
11:16:48 whether those exposures could cause kidney cancer, and then
11:16:52 also as a rebuttal to Dr. Hatten.
11:16:54 And to do that, to understand Dr. Hatten's methods and
11:16:59 opinions, I had to do basically all the work independent of
11:17:04 Dr. Hatten, so I've done my own evaluation about each of those
11:17:08 chemicals generally and at those levels and what's the evidence
11:17:12 for causing cancer, and it's a very specific, well-accepted
11:17:17 methodology that we'll go into on how you approach that.
11:17:20 Q. So you've used your decades of experience in epidemiology
11:17:23 to do your own general causation analysis?
11:17:26 A. Well, yeah, but it's more broad than that. It's not just
11:17:27 the epidemiology. It's really the carcinogenesis, and I've
11:17:33 done -- not only in court, I've done this -- I've published on
11:17:36 cancer causation and methods for cancer causation, participate
11:17:40 in panels around that. So, yeah, so it's now almost 40 years
11:17:45 of experience.
11:17:46 Q. Did you prepare an expert report?
11:17:48 A. I did.
11:17:49 Q. Can you please open up the binder right in front of you?
11:17:53 This is -- this is -- in front of you is a document that's been
11:17:57 marked as Defendant's Exhibit 226. Do you see that document?
11:18:01 A. Yes.
11:18:02 Q. What is that?
11:18:04 A. This appears to be my general causation report that covers

all the different cancers as part of the Camp Lejeune litigation, which is something like more than 400 pages with thousands of citations.

Q. Did you write this report?

A. Yes.

Q. And is your curriculum vitae included as an exhibit to the report?

A. Yes.

MR. GUYNN: Your Honor, I move to admit Defendant's Exhibit 226 into evidence.

THE COURT: Received.

(Defendant's Exhibit Number 226 received.)

Q. Dr. Shields, have you prepared a set of visuals to assist with your testimony today?

A. I have.

Q. Okay.

MR. GUYNN: Your Honor, I'm going to display the demonstrative exhibits on this easel. I've also prepared a set for you, the courtroom deputy, your staff, if you'd like. May I approach?

THE COURT: Yeah. What do you have?

MR. GUYNN: I've got -- I've got copies of these demonstratives, if you'd like to follow along, if there's any difficulty for anybody in the courtroom seeing.

THE COURT: Yeah, go ahead.

11:19:08 MR. GUYNN: Okay. Thank you.
11:19:36 Q. Okay. Dr. Shields --
11:19:44 MR. GUYNN: And, Ms. McKeever, would you put --
11:19:47 please put up slide 9 -- looking at slide 9. It's the table.
11:19:53 It's on the -- it's on the flip charts.
11:19:55 Q. Okay. Dr. Shields, would you please summarize your
11:20:03 opinions for the Court --
11:20:08 A. Sure. So --
11:20:08 Q. -- regarding general causation? I apologize.
11:20:10 Would you please summarize your opinions regarding general
11:20:13 causation for the Court?
11:20:14 A. Yes. I'm waiting for the right flip page. Basically,
11:20:20 these fall into three -- so summarizing my opinions, there's
11:20:32 basically three general areas. Number one is that Dr. Hatten
11:20:39 was testifying about the wrong type of cancer, which is
11:20:43 specifically the renal pelvis and not the renal cell cancer,
11:20:45 but we'll talk about both of them.
11:20:47 He was using improper causation methodology, and we'll go
11:20:52 into that detail. But, briefly, when you read his report and
11:20:58 his deposition, it's very clear that he was using one
11:21:03 methodology and was doing it incorrectly. And then when he
11:21:07 came to court, he said, well, really, he did it two ways and,
11:21:10 actually, it was really one way. And now it's sort of
11:21:13 bifurcated, but he's still using the same improper causation
11:21:17 methodology.

11:21:18 Q. And, Dr. Shields, in terms of your general causation
11:21:21 opinions, can you please summarize those for the Court?
11:21:24 A. Sure. Okay. So you want me to focus on this, okay. So
11:21:28 this is a demonstrative that I put together which is showing
11:21:33 what is not only my conclusions, but scientific consensus
11:21:38 around these specific exposures, so the benzene,
11:21:40 trichloroethylene, perchloroethylene and vinyl chloride, and
11:21:45 then the combination of all of them together, which is really
11:21:49 what the drinking water was. I mean, people were either
11:21:51 drinking water or they weren't, and they were getting exposed,
11:21:53 depending on which treatment plant, to one or several of these
11:21:57 chemicals.
11:21:57 The first line is the kidney cancer, renal cell. So we'll
11:22:02 talk about how there's two different types of cancers of the
11:22:05 kidney that's relevant today. The other one is the renal
11:22:08 pelvis. For the renal pelvis, that's the lower one. There is
11:22:12 no agency that has concluded that any of these chemicals are a
11:22:17 known cause of the renal pelvis cancer, which is also
11:22:21 abbreviated the UTUC, the upper tract urothelial cancer. In
11:22:24 fact, in their evaluations, there's not even credible
11:22:29 associations, and I'll define what that means, but the key word
11:22:34 is "credible."
11:22:34 For kidney cancer, renal cell type, benzene, PCE and vinyl
11:22:41 chloride have been extensively studied, and there's not
11:22:45 credible associations for those for renal cell. For TCE, TCE

11:22:50 at high levels of exposure may be a cause of kidney cancer, but
11:22:54 it's really important to understand that dose matters. Dose
11:22:58 makes the poison. We'll explain why at Camp Lejeune levels,
11:23:03 based on all the human evidence, it's pretty good reassurance
11:23:06 that being at Camp Lejeune did not, will not, and unlikely
11:23:14 caused kidney cancer that's the renal cell type. And for all
11:23:17 of them, definitely not the UTUC.
11:23:22 Q. Okay. And now turning to Dr. Hatten, have you analyzed
11:23:26 Dr. Hatten's report?
11:23:29 A. Yes.
11:23:30 Q. Have you reviewed the testimony that he provided yesterday
11:23:33 during trial?
11:23:34 A. As well as his deposition testimony.
11:23:37 Q. Do you agree with Dr. Hatten's general causation opinions
11:23:40 as reflected in his report and his trial testimony and his
11:23:44 deposition?
11:23:44 A. There are a number of fatal flaws in his testimony.
11:23:49 Q. Okay. And, Dr. Shields, I think that you -- you distilled
11:23:53 those -- those -- your concerns with Dr. Hatten's work in this
11:23:55 case into three discrete bullet points. Would you please
11:23:59 summarize those for the Court?
11:24:01 A. Right. So I just mentioned -- and we'll go through
11:24:03 this -- is it's really important to distinguish renal cell
11:24:08 cancers from the renal pelvis cancers, which are these upper
11:24:12 tract urothelial carcinomas, the UTUC. They're different

11:24:18 cancers. We'll talk about it. They look differently. They
11:24:19 get treated differently. For the most part, they have
11:24:23 different causes except that tobacco smoke is a known cause of
11:24:26 both.
11:24:26 The second thing is, is how Dr. Hatten put together his
11:24:31 causation methodology and applied it was using a
11:24:36 non-conventional, non-validated methodology that the Court
11:24:39 appropriately said all of us have to follow the science, which
11:24:43 kind of knocks out the methodology that Dr. Hatten did.
11:24:47 And then even if you assume that he was following a proper
11:24:51 causation methodology, to get to his -- his opinions, there is
11:24:57 really a lack of rigor. We talked about -- well, he talked
11:25:01 about the Camp Lejeune publications. What he said they showed,
11:25:07 they don't show. The data are really clear from those papers,
11:25:11 and how Dr. Bove wrote up those papers were really clear. So
11:25:15 he misrepresented the real-world Camp Lejeune data.
11:25:18 His methodology, I'll show you how it was significantly
11:25:24 flawed. So he missed most of the relevant papers that he
11:25:28 should have found and cited, and then he didn't do something
11:25:32 called weigh of evidence. So, you know, once you get 60 or 80
11:25:36 papers in front of you, you got to decide which are the good
11:25:38 ones and which are -- which are the junk ones and decide
11:25:41 whether or not you're seeing a signal of consistency in dose
11:25:45 response.
11:25:45 As part of that process, a fundamental flaw that he

11:25:50 maintained through the testimony yesterday was jettisoning
11:25:55 statistical significance. That's a basic methodology in all of
11:26:02 science. When you get numbers, you know, you can interpret
11:26:05 numbers any way you want. The science of statistics tries to
11:26:09 say, well, are these numbers happening by chance alone, or is
11:26:14 there something else that's going on? It's basic scientific
11:26:18 methodology that the Court said you have to use. And so
11:26:22 Dr. Hatten, when he was showing, well, gee, all these numbers
11:26:26 are positive, but not statistically significant, what that
11:26:29 means is all those numbers refuted his opinion.
11:26:33 And the last is that he then feeds these things into this
11:26:38 Bradford Hill methodology, which I can explain now or later,
11:26:42 but that's the causation framework we use, and how he
11:26:46 interpreted -- going back, Bradford Hill wrote these what he
11:26:51 called viewpoints back then in '65. We're a lot smarter now on
11:26:54 how to do causation methodology, but how Dr. Hatten applied it,
11:26:59 consistency, dose response, strength of association, were done
11:27:04 not only improperly, but, basically, a hand-waving.
11:27:07 The key thing to all this testimony, which I've learned in
11:27:09 many, many court cases, is that reasonable scientists can
11:27:14 disagree, but there has to be transparency and reproducibility
11:27:18 and an ability to agree to disagree on certain points. I can't
11:27:23 find that from Dr. Hatten's report, deposition testimony or his
11:27:27 testimony yesterday. There was a lot of hand-waving.
11:27:29 Q. All right. So there's a lot there, and you eat an

11:27:32 elephant one bite at a time, so let's start with your first
11:27:36 overarching critique of Dr. Hatten's opinion.
11:27:37 So to start with, just to set the stage, this is something
11:27:41 that, like, might be taken as a given but I think it's
11:27:43 important for us to cover it today, what is cancer?
11:27:50 A. Sure. So cancer is basically cells in our body that get
11:27:54 sick. So our body is made of organs, stomach, kidney, brain,
11:28:01 heart. And those organs are made of cells, and those cells
11:28:07 tell the organs' business what to do. So kidney cells help
11:28:11 filter the blood and control salt balance. The liver filters
11:28:15 the blood. The heart pumps the blood. The brain is about
11:28:18 consciousness and thought.
11:28:20 So what controls those cells is the genes inside the
11:28:24 cells. They're the sort of master planner for what these cells
11:28:29 should do. Over time, there's three ways that these genes in
11:28:35 the cells can get damaged. Cells in our body grow, they do
11:28:41 their work, they die naturally, and then they get replaced.
11:28:45 Every time there's that replacement -- those genes have to get
11:28:50 reproduced -- you can get typographical errors.
11:28:53 Q. And, Dr. Shields, what is a typographical error?
11:28:56 A. Well, so the genes are made of DNA that are basically four
11:29:00 nucleotides, and those four letters code for different
11:29:04 proteins. And if you substitute one letter for another, you
11:29:08 either will get a different protein or you'll stop the gene
11:29:12 from being -- from working. And some genes promote cancer and

11:29:16 some genes prevent cancer, and if you mess them up, you're now
11:29:20 throwing things out of whack.
11:29:21 So the second way is that our body makes its own
11:29:25 carcinogens. So when we fight infection or our immune system,
11:29:29 they also can mess up the DNA.
11:29:30 The third way is exposures from outside the body. We are
11:29:36 exposed to carcinogens massively every day, all the way back to
11:29:42 when we're babies in our mothers' bellies. In fact, that's
11:29:44 probably where most of our gene damage happens. And it's
11:29:48 amazing that we don't all get cancer by the age of three
11:29:50 because we have so much gene damage, and that's because the
11:29:54 body has mechanisms to stop the cancer process.
11:29:58 So we have all these -- you know, metabolism that could
11:30:03 detoxify some of these chemicals. DNA repair, so when those
11:30:06 genes get messed up, our cells have enzymes to recognize it and
11:30:11 say, hey, I can fix that. I can white out that typographical
11:30:15 error and put in the right one.
11:30:16 Then the third way is that if you mess up the genes and
11:30:21 those repair enzymes are ineffective and it's in a bad place in
11:30:25 the gene, then there's something called programmed cell death
11:30:28 and the cell just dies, and dead cells don't become cancer.
11:30:32 But over time, those mechanisms are not perfect, and as we
11:30:37 get older, you start to accumulate more and more damage, some
11:30:42 of which puts you on that cancer process.
11:30:44 And but the point that's really important here is that

dose matters. So we could be exposed to chemicals every day, and we are, but our bodies can handle it. I mean, common exposures, when you broil or barbecue foods, those black lines are packed with carcinogens, heterocyclic amines, polycyclic aromatic hydrocarbons. There's just, you know, all different ways that we're exposed to different carcinogens, but that's just one example.

Q. Okay. So many witnesses in this case have used the term "kidney cancer." Dr. Shields, is "kidney cancer" a term that includes several -- several different types of cancer?

A. Yeah, and it depends on the context, okay? So let me just go through the anatomy here. So on the right of this diagram is the kidney. It looks like a kidney bean, okay? The kidney's role is to filter blood for toxins, as well as salt balance in the blood, as well as making hormones for blood pressure and that sort of thing.

But those kidney cells, as they're doing their business as part of a nephron, is actually making urine. The urine starts to pool and goes into a funnel, which is the renal pelvis, which then allows the urine to go through the ureter into the bladder, and eventually you urinate, okay?

So you have -- I mean, there's more than just two principal types, but you have -- the principal types that are relevant today is the renal cells that do the filtering and the renal pelvis that does the collecting. You can get cancer of

either one.

Q. And what are the main differences in similarities between renal cell carcinoma in the kidney and renal pelvis cancer, or UTUC, in the renal pelvis?

A. So they're really -- the cancers are very different. They're different cell types. They look different under the microscope. They're treated differently. The risk factors, some of them are shared. Like I mentioned, cigarette smoking is a -- is a -- clearly a cause of both. Obesity is a cause of both.

But for chemicals, TCE that we're talking about today, may cause renal cell cancer, but not the renal pelvis cancer, as opposed to another occupational carcinogen, aromatic amines in the dye industry, can do renal pelvis cancers, but not renal cell cancers.

And the last thing I'll mention is that you can get both of these cancers based on what you inherit from your parents, okay? And so there's -- there's renal cell cancer families, what they call VHL families, and then there's renal pelvis families, what they call Li-Fraumeni families. If you have one gene, you don't get the other cancer; and if you have the other gene, you don't get this cancer. So these are really distinct.

The last thing I'm just going to mention, though, is that in the epidemiology world, some studies will separate these out and some will combine them together, and they do that for a

variety of epidemiologic methods, but it's not to imply that -- that the causes are the same.

And, in fact, when you have about -- 85 percent of kidney cancers in these studies that combine both are about renal cell, and 25 -- and about 10 percent are the renal pelvis. When you get the results for the combined thing, they're not talking about the renal pelvis cancers. They're talking about the renal cell cancers. You just can't say anything about the cause of the renal pelvis cancers, the UTUC.

Q. Okay. So in demonstrative number 3 here, there's a set of graphs. Can you please explain to the Court, what is the scientific significance of these graphs?

A. Well, I'm going to show a variety of ways throughout this testimony about how renal cell cancers are distinct from renal pelvis cancers. So the graph on the left is -- these are graphs that you can get -- you pull off the NCI or CDC websites from the -- from tumor registries across the country.

And what we're seeing is that the graphs both show that the cancer -- the increase of these cancers happen as you get older, so you're accumulating that damage. But, more importantly, on the website, you can pull down "give me the frequency of the renal cell and renal pelvis cancer." But there's also part of the drop-down where you can just do renal cell cancer or the renal pelvis cancer, and that's because the scientific community looks at these as different. You can --

11:35:44 you can lump them together for some reasons, but at the end of
11:35:47 the day, you have to -- you -- you have to treat them
11:35:50 separately.
11:35:51 Q. So are renal cell carcinoma and renal pelvis carcinoma
11:35:56 different diseases in different parts of the body that occur at
11:36:00 different rates and for different reasons?
11:36:03 A. Well, I'll -- I'm going to say yes, but -- okay, when you
11:36:07 say different parts of the body, they're both within the body
11:36:10 of the kidney, but you can have multiple types of cancers
11:36:13 within the body of the kidney.
11:36:16 Q. Okay. Dr. Shields, did Dr. Hatten testify that
11:36:20 Mr. Mousser has renal pelvis carcinoma?
11:36:24 A. That's what I read yesterday, yes.
11:36:26 Q. Why isn't it -- why is it important for the Court to
11:36:29 differentiate between testimony about kidney cancer carcino- --
11:36:33 or renal cell carcinoma and testimony about renal pelvis
11:36:38 carcinoma?
11:36:39 A. So, as I mentioned, they're different cancers. But in
11:36:42 terms of causes, TCE may be a cause of kidney -- of renal cell
11:36:49 cancers. That is driven by a few studies, like this Charbotel
11:36:53 study and others, at very high levels of exposure. Those
11:36:58 studies that have driven this consensus for kidney cancer may
11:37:05 be caused by TCE exclude the urinary tract cancers. It's not
11:37:11 part of the equation.
11:37:12 So what's driving EPA, the National Toxicology Program,

11:37:17 the International Association of Research on Cancer, all of
11:37:21 them are looking at data that is not about the UTUC, not about
11:37:26 the renal pelvis. It's about the renal cell carcinomas.
11:37:29 That's a fundamental problem here.
11:37:32 Q. Dr. Shields, in Dr. Hatten's testimony yesterday and then
11:37:36 in his report and in his deposition, did he acknowledge the
11:37:40 distinction between renal cell carcinoma that occurs in the
11:37:43 kidney, the normal kidney tissue, and renal pelvis carcinoma or
11:37:47 UTUC that does not?
11:37:50 A. He did, and I'll also note that he did not cite one paper
11:37:54 for any of these chemicals as a statistical association with
11:37:59 the renal pelvis, urinary tract cancers.
11:38:03 Q. So I don't want to beat a dead horse here, but did -- did
11:38:06 Dr. Hatten testify -- well, Dr. Hatten testified that the
11:38:10 evidence regarding kidney cancer can be relied upon to consider
11:38:14 renal pelvis cancer or UTUC causation. Do you agree with that
11:38:19 testimony?
11:38:19 A. No. Again, there's a lot of epidemiology studies that
11:38:23 will lump them together, but then you can't make conclusions
11:38:26 about them separately. You have to look at the -- and there's
11:38:29 less of them, but you have to look at the papers when they're
11:38:32 available that separately look at the renal cell cancers from
11:38:36 the renal pelvis urinary tract cancers.
11:38:39 Q. So why does this mistake in Dr. Hatten's work matter to
11:38:44 the Court?

11:38:45 A. Well, if you got the wrong cancer, then you can't -- then
11:38:48 everything else falls apart.
11:38:51 Q. Okay.
11:38:51 MR. GUYNN: Your Honor, I'm going to approach the
11:39:00 demonstrative exhibits. Because Dr. Hatten did not analyze
11:39:05 epidemiological data related to Mr. Mousser's renal pelvis
11:39:09 carcinoma, but rather focused his analysis on kidney cancer,
11:39:12 I'm going to place a red checkmark next to "wrong cancer."
11:39:15 Q. And is using -- is analyzing the wrong cancer, does that
11:39:32 just -- does that mean -- is that an independent reason to just
11:39:34 reject his analysis?
11:39:35 A. Correct.
11:39:38 Q. Okay. Now, before we move on to your second and third
11:39:43 overarching critiques of Dr. Hatten's opinions, I want you to
11:39:46 tell the Court about your causation methodology and the
11:39:49 scientific principles that you apply, and then I want you to
11:39:52 tell the Court what your expert determinations are using that
11:39:56 methodology. Then we'll turn to your concerns with
11:39:59 Dr. Hatten's opinions.
11:39:59 MR. GUYNN: Okay. So if you could just go to the
11:39:59 fourth slide.
11:39:59 Q. Okay. Dr. Shields, what is the starting place for a sound
11:40:06 general causation methodology?
11:40:09 A. Okay. So this is -- this is what I did, but this is
11:40:16 standard accepted methodology, whether it's done by EPA or

11:40:22 International Association of Research on Cancer. It's a very
11:40:25 systematic methodology, okay? The first thing you got to do is
11:40:30 identify the world's body of studies that you need to evaluate,
11:40:34 okay, and there's well-accepted methods to do that.
11:40:37 You gather all the information you can find. You're
11:40:43 starting to sort through relevant, not relevant. You have
11:40:46 inclusion/exclusion criteria. And then what you do is you cite
11:40:50 all of them, okay? So that's why my report has so many
11:40:53 different citations.
11:40:54 And we'll see with Dr. Hatten, he had some fundamental
11:40:58 flaws in his search strategy that he missed most of the papers,
11:41:01 and the -- and the miss was biased towards finding papers that
11:41:06 would have refuted his opinion. And so now you have these
11:41:10 studies. You have --
11:41:11 Q. Let me just pause you there real quick on literature
11:41:14 search. Does a poor literature search undermine the
11:41:18 reliability of the subsequent analysis?
11:41:20 A. Yeah, I love -- I love using cliches. So this is sort of
11:41:23 like a house of cards without the cards. And, you know, if you
11:41:25 don't know what you're missing, you know, ignorance is bliss.
11:41:29 So I just used two metaphors.
11:41:31 Q. Okay. Now, once you gathered lots of studies, what's the
11:41:35 methodology for evaluating them and deciding how to integrate
11:41:38 them into your analysis?
11:41:40 A. Right. So the process is weigh of the evidence --

11:41:44 weighing the evidence. Some studies are really good. Some
11:41:48 studies are really bad. No single study is ever definitive
11:41:52 because there's always things in a study that you may not know
11:41:56 that's actually giving you false positives or false negatives.
11:42:00 So the weighing of the evidence is to look at the study
11:42:03 for was it doing what it was originally designed to do; was the
11:42:09 study big enough, so was it robust enough, to give you answers
11:42:12 that you're looking for; what's the quality, the methodologic
11:42:16 quality. So if they said, hey, we're going to send surveys to
11:42:21 100,000 people and you only get back 20,000, you had a good
11:42:25 intent, but the methodology got subverted, got messed up.
11:42:28 Then you're looking for something called chance. That's
11:42:32 the statistical analysis, are those results there by flipping a
11:42:36 coin, or is it really accepted from a -- from a rigorous
11:42:40 statistical analysis. Then there's something called bias and
11:42:44 confounding. We'll talk about that. But there's lots of ways
11:42:47 that a study could have a positive result or have a
11:42:51 non-positive result that get messed up.
11:42:53 And I'm giving you a lot of epi speak, but this is -- this
11:42:55 is a science that -- that is applied, that's accepted. And so
11:43:01 you're going through these studies to try to weigh them to
11:43:04 figure out which are the ones that are most informative.
11:43:06 And then on top of that, then you start feeding it into
11:43:09 this Bradford Hill framework. So you're looking for
11:43:13 consistency, dose response, strength of association.

11:43:16 And then if you actually come up with the idea that, I
11:43:20 think there's sufficient human evidence to call this a kidney
11:43:23 carcinogen, then you don't stop there. You then have to say,
11:43:27 well, at what dose is it statistically associated with that
11:43:33 cancer, with that kidney cancer, with that renal cell cancer?
11:43:34 And, again, dose matters.
11:43:38 Q. All right. Dr. Shields, I want to just pause on several
11:43:40 of the terms that you used to make sure they're clear. What is
11:43:44 statistical significance and why does it matter?
11:43:47 A. So there's -- so when you try to say -- you look at two
11:43:51 populations, Camp Lejeune versus Camp Pendleton, and you say,
11:43:56 hey, there's twice as many kidney cancers -- and I'm making
11:43:59 this up because that's not what the studies actually show --
11:44:00 but twice as many kidney cancers at Camp Lejeune compared to
11:44:04 Camp Pendleton, there could be reasons for that, including bias
11:44:11 and confounding, but one of the rigorous ways to look at it is
11:44:14 the statistical analysis. By looking at the variation of how
11:44:20 the exposures vary across the two -- the two groups, you come
11:44:25 up with a P value, a confidence interval. There's other ways.
11:44:31 You know, statisticians, that's a Ph.D. science by itself,
11:44:35 okay? And doing the statistical analysis is so fundamental. I
11:44:42 mean, it goes back to medical school. I don't even know where
11:44:44 it started. But in going to medical school in '79 till now,
11:44:53 there are statisticians who say, hey, we need to look at this
11:44:57 better, but no one ever says jettison it, which is what

11:45:00 Dr. Hatten did.

11:45:01 You can't submit a paper to a quality journal without a
11:45:05 statistical analysis. You can't get a grant funded from the
11:45:10 federal government or a foundation without a statistical
11:45:13 analysis plan. You can't do a clinical trial and go to an
11:45:18 ethics board without a statistical analysis plan. This is --
11:45:21 this is fundamental. A doctor is not going to treat you based
11:45:25 on multiple studies that are all chance findings. I can't
11:45:30 emphasize how the American Statistics Association, New England
11:45:34 Journal of Medicine, all of them have editorials.

11:45:37 There are limitations of the concept. I mean, so you
11:45:42 could have something that's statistically positive may not
11:45:44 represent truth because it still could be chance, or you can
11:45:48 have something that's not statistically positive that may
11:45:52 represent truth, but the evidence in front of you is that it's
11:45:56 a chance finding.

11:45:56 And so when we look at all of this, the way we deal with
11:46:00 this in epidemiology is really consistency across studies.
11:46:04 Even if you have a great study, if it doesn't get replicated in
11:46:08 other studies, it's still more likely to be a chance finding.

11:46:10 The second way you deal with this is -- we'll talk
11:46:13 about -- is dose response, which is the sort of checks and
11:46:16 balances on statistics.

11:46:18 Q. Okay. So in epidemiology, what is the difference between
11:46:23 a result and a study that is statistically significant and one

11:46:27 that is not?
11:46:30 A. Well, so, again, if you have statistical significance,
11:46:34 since no single study is definitive, your conclusion is that
11:46:39 there's a statistical association. Your conclusion is this may
11:46:43 contribute to causation in isolation. If it's not
11:46:48 statistically significant, the best thing you could say is this
11:46:51 is numerically increased. Maybe in a bigger study or a better
11:46:55 study, it could be positive, but that's all speculative. The
11:46:58 evidence in front of you is -- as a scientist, the scientific
11:47:01 evidence, is if it's a chance finding, you can't say, well,
11:47:05 gee, this is actually contributing to a causation opinion.
11:47:09 Q. Okay. Now, you've testified several times that there's
11:47:12 this concept called dose response that's just foundational to
11:47:15 everything that we're doing today and that you do in this
11:47:17 science. Would you please explain the concept of dose response
11:47:21 to the Court?
11:47:23 A. Yeah. So in cancer, I mean, it makes sense: The more you
11:47:29 get exposed, if it's causing the cancer, the higher the risk.
11:47:33 This goes back to, you know, the dose makes the poison from
11:47:36 Paracelsus in the 1500s. The dose makes the poison. Drinking
11:47:41 water is good. Too much drinking water as a marathon runner
11:47:45 will swell your brain. Eating salt in the food is important.
11:47:49 Too much salt will increase your blood pressure. And so
11:47:52 there's all sorts of different ways that the dose makes the
11:47:55 poison.

11:47:55 For cancer, it's consistent. I don't know of any
11:47:59 exceptions where if something's causing cancer as a chemical,
11:48:04 the more you're exposed, the higher the risk. And, conversely,
11:48:08 there's going to be levels of exposure because of all those
11:48:10 protective mechanisms that you can't measure the increased
11:48:14 risk. You might speculate that that increased risk is still
11:48:18 there, but you can only speculate because you don't have the
11:48:21 scientific evidence to support that.
11:48:23 Q. So how does this graph illustrate the concept of dose
11:48:27 response?
11:48:27 A. Well, it's showing, you know, increased cancer on the
11:48:30 left, increasing dose on the bottom. I have it as a straight
11:48:35 line. It's not always a straight line. It could -- it could
11:48:37 be different shapes, but always more is more.
11:48:43 Q. All right. So I just want to --
11:48:44 MR. GUYNN: Your Honor, may I approach?
11:48:45 THE COURT: Yeah.
11:48:46 Q. So if I'm looking at this graph right, do you see that
11:48:50 there's this section that says "No Effect" --
11:48:53 A. Correct.
11:48:54 Q. -- that I just marked with the red pen?
11:48:55 A. Yes.
11:48:56 Q. Do you see that?
11:48:57 If I'm understanding this correctly, is it true that
11:49:01 there's a certain dose of a dangerous chemical like, say, a TCE

that I could ingest without it hurting me?
A. So there's -- there's -- it depends on the context. So one context, if you're a government regulator, EPA and others have made the assumption -- because, honestly, we don't know better -- that there's no threshold effect. So we want to get exposures down to as low as possible because there could be poison, there could be problems, but that from a precautionary principle, we don't want to find out in 40 years that there's a problem. We assume that it's a poison. So you have that, you know, no effect, but no threshold effect.

In real life, because of all these protective mechanisms -- we get exposed to all these carcinogens -- you know, about one in three people die of cancer, but a hundred percent of people get carcinogens in them all the time. And so it's all those protective mechanisms that are really preventing this from happening.

And, you know, I guess the other thing I'm going to point out now -- well, I guess we're going to get to the -- to the -- to the other figure, so I'll hold off and stop talking.

Q. Okay. Dr. Shields, you've also referenced the concept of an occupational exposure to a chemical. Can you please explain that to the Court?

A. Yeah. So when you're looking at the body of evidence that side on causation, you're going to look at the range of exposures in the human population. So in the -- in the

11:50:40 workplace, there are some workers who are exposed to thousands
11:50:43 of fold higher levels than, for example, at Camp Lejeune.
11:50:47 Looking at those studies, you can decide whether or not
11:50:52 something -- we have the human evidence to say something causes
11:50:55 cancer. Like, for example, the benzene, PCE and vinyl chloride
11:50:59 don't. And then for TCE, if you want to say it may cause
11:51:03 kidney cancer, renal cell cancers, at what level of exposure,
11:51:06 and do those studies show lower levels of exposure that have no
11:51:10 increase? Because at those low levels of exposure, which are
11:51:13 still high and orders of magnitude higher than Camp Lejeune, it
11:51:17 gives really good reassurance that Camp Lejeune drinking water
11:51:22 will not, did not cause any type of kidney cancer.
11:51:27 Q. And what's the difference between an occupational exposure
11:51:30 like you've just described and an environmental exposure like
11:51:34 what was present at Camp Lejeune in the water?
11:51:37 A. Well, so in the workplace, with the exception of at least
11:51:41 one paper that I'll show you, workplace is usually inhalation,
11:51:44 so it's air coming into you, whereas, Camp Lejeune is drinking
11:51:49 water.
11:51:50 We're going to talk about the Morgan study where they
11:51:52 actually had both because there was contamination on -- at this
11:51:57 aircraft facility. So the authors wrote about drinking water,
11:52:01 showers on site. So that's like Camp Lejeune on steroids,
11:52:05 because you had both Camp Lejeune levels as well as those
11:52:09 massive inhalation levels, and that study still didn't show any

11:52:13 increase of any type of kidney cancer.
11:52:16 Q. Okay. Now, you mentioned in your prior descriptions of
11:52:19 the methodology, that you -- you look for statistical
11:52:22 associations, but then you've got to somehow bridge the gap to
11:52:25 causation.
11:52:25 So I want you to explain to the Court, in the context of
11:52:28 an epidemiological analysis, what is meant by an association
11:52:33 between a chemical exposure and a disease?
11:52:36 A. So associations are, from any individual study, is A
11:52:43 statistically associated with B? So is Camp Lejeune drinking
11:52:47 water statistically associated with kidney cancer? That
11:52:52 association could be there by chance alone. The statistics
11:52:56 could rule that out. But there still could be other
11:53:00 fundamental problems in that study with chance, bias and
11:53:06 confounding, and I think that's where you're going to on the
11:53:09 next --
11:53:10 Q. Yeah. Yeah, could you please explain to the Court the
11:53:16 difference between an association and a causal relationship?
11:53:19 A. Sure. So, for example, when you look at the peer-reviewed
11:53:23 published Bove publications, and in one of the four, the
11:53:28 mortality supplement had some statistical increases, that's
11:53:33 probably chance alone for reasons that we'll talk about, but
11:53:36 that association doesn't drive a causation opinion by itself.
11:53:40 The best way I can explain confounding is if we did a
11:53:45 hundred studies of gray-hair people and heart attacks, you

would probably find in every one of those studies that having more gray hair is associated with increased heart attacks. That's not because gray hair is causing heart attacks. Gray hair is just a marker for adulthood, hypertension, diabetes, high cholesterol. That's a confounding variable.

So when you say that I'm seeing an association, part of the weight of evidence is still to say, are there confounding variables? You may know some of them, but the problem is, in any single study, you don't know what you don't know, which is, again, why you have to look at multiple studies to see if you have the consistency in the dose response.

Q. All right. Dr. Shields, would you now please explain the methodology that an epidemiologist should use to determine whether there's a causal relationship, rather than just an association between a chemical exposure and a disease?

A. Yes. So it's an iterative process. It goes around and around, as you -- until you make your final conclusion. But the top part is the weight of evidence. So you're looking at scope, size, quality, chance, bias, confounding, as well as conflict of interest of the authors and who funded the study as you're feeding into this framework of Bradford Hill criteria.

So now you're looking at weighing all those individual studies. What's the consistency of the studies? Is there a dose-response relationship? Is there a strength of association? There's other things to do for Bradford Hill, but

when you have enough human studies like this, these top three is what you need. If the answer is, yes, I think there is causation, then the next step is at what dose because dose matters.

What I will say is if you wanted to reproduce this for Dr. Hatten, it would look totally different because at the top, he would have Bradford Hill criteria, and at the bottom, he would use the ATSDR 2017 assessment of the evidence, which is a very unique thing that was done by ATSDR for presumptive disability and not as a validated method of causation analysis.

Q. Okay. And we'll get to that later.

So, Dr. Shields, did you follow this general causation methodology in reaching your conclusions?

A. Yes.

Q. Did you apply all of the principles of dose response, statistical analysis and the other -- other principles that you just discussed with the Court?

A. Yes.

Q. Okay. Are each of the opinions that you've offered or you're going to offer based on your specialized education, training and peer-reviewed scientific literature that you analyzed?

A. Yes.

Q. Have you expressed all of your general causation opinions and will you express them to a reasonable degree of scientific

11:56:37 certainty?
11:56:38 A. Yes.
11:56:39 MR. GUYNN: Ms. McKeever, go to slide 9.
11:56:42 Q. Okay. Dr. Shields, we've looked at this chart already,
11:56:46 but will you please walk through your expert opinions as
11:56:50 they're summarized in this table and explain them to the Court?
11:56:54 A. Yes. So we have two rows, one for kidney cancer
11:56:58 renal cell and one for kidney cancer, the renal pelvis urinary
11:57:03 tract cancers. For the bottom one, starting first, which is
11:57:11 the relevance to the trial here, there is no agency, nor from
11:57:15 my analysis, that says that any of these chemicals are a cause
11:57:20 of renal pelvis urinary tract cancers.
11:57:21 Then for the top one, the renal cell, benzene, PC, VC and
11:57:30 the combination of the two, there's no credible associations
11:57:33 for them.
11:57:34 For TCE and kidney cancer, the renal cell cancers, at the
11:57:39 highest level of the human exposure, such as cardboard workers
11:57:42 and people who are in these factories making machine screws and
11:57:46 that sort of thing where there's really high levels -- and
11:57:49 we'll see that -- TCE may be causing kidney cancer. There's
11:57:54 some nuances to how you interpret the data so that it's not a
11:57:57 full consensus, but say that it is -- it is a consensus.
11:58:01 For Camp Lejeune levels, if you want to say that TCE is
11:58:05 causing kidney cancer, you can look at the levels and
11:58:09 extrapolate back to Camp Lejeune levels and say that, as I

said -- I'll probably say it again -- that there's pretty good reassurance that the levels at Camp Lejeune were not and will not be causing kidney cancer.

Q. And we'll unpack that in a moment, but just bottom line, Dr. Shields, Mr. Mousser had renal pelvis carcinoma, or UTUC. Dr. Shields, is there scientific evidence that these chemicals cause renal pelvis carcinoma at the Camp Lejeune exposure levels?

A. I'm not aware of a single study that has a statistical association, and I'll note also that Dr. Hatten didn't cite any.

Q. And would that apply as well to UTUC?

A. Well, that's the same thing.

Q. Okay. Dr. Shields, you testified earlier that dose matters in epidemiology and as we think about whether a chemical can cause a disease. Can you please walk us through this chart and help -- and explain to the Court, how does it demonstrate that principle in the context of TCE exposure?

A. Yeah. So this is numbers from my report. On the right are two studies that are good quality that show a statistical association of TCE with renal cell cancer, okay? They didn't actually include the urinary tract cancers.

And you could see on the top right, which is the Charbotel 2006, the average level was 885 ppm, parts per million, in the air. So air is, you know, oxygen, carbon dioxide, nitrogen

11:59:53 oxides. 885 of the million parts is the TCE, and you're
11:59:59 inhaling that. You don't have a choice. You have to inhale
12:00:01 air. So the paper also shows that the risk is at 335 ppm
12:00:07 years. So it's not enough just --
12:00:09 Q. Dr. Shields, we'll get to each of the reports in a second.
12:00:10 MR. GUYNN: May I approach, Your Honor?
12:00:11 THE COURT: Yeah.
12:00:11 MR. GUYNN: Let's just look -- and I -- and it might
12:00:15 be -- it might be hard to see, Your Honor, so if you -- if
12:00:17 you'd like to reference on your specific copy.
12:00:19 Q. Do you see that on the chart, there's -- there's these
12:00:22 letters "ppm"?
12:00:23 A. Yes.
12:00:24 Q. What does -- what do the letters "ppm" refer to?
12:00:27 A. That's what I was just saying, parts per million.
12:00:28 Q. Okay. Perfect. And then you also see these arrows. What
12:00:33 do these arrows represent in the context of exposure?
12:00:36 A. Yeah, so they are -- they're representing the levels of
12:00:39 exposure in those individual studies.
12:00:42 Q. Okay. Now, if these arrows representing exposure levels
12:00:45 were truly to scale, how big would the Camp Lejeune water
12:00:49 exposure arrow be?
12:00:50 A. So I think we kind of need to go back because that's --
12:00:55 Q. Then let's go back.
12:00:55 A. -- that states -- that's -- that's kind of out of context

because -- because what's important here is that the two on the right are positive studies showing the arrows pretty high. The next two are ones that are also of reasonable quality that didn't have an increased risk. And what you're seeing, if you go from Charbotel down to Axelson, the dose response. So the two on the right were positive. The two in the middle were not.

Q. So, Dr. Shields --

A. Then you've got --

Q. -- tell the Court, what is Charbotel 2006 that's referenced on this chart?

A. Yeah, that's -- that's the paper that's kind of driving the world to say that TCE is causing renal cell carcinomas. It's a study from France. It's a case-control study. We can go into the details, but what's important is only at the highest level, that 885 parts per million, was there an increased risk. At lower levels, they didn't see it. So that helps us with the Charbotel where that threshold might be that we could measure the increased risk.

Raasch-Nielsen was 60 to 90 parts per million. You know, no single study is definitive, but it's probably somewhere between the two that are actually causing kidney cancer because at lower-level exposure, good quality cohort studies, you don't see that increased risk.

Q. Dr. Shields, what is Axelson 1994 that's on this chart?

12:02:18 A. So these are -- these are all different. So Charbotel was
12:02:21 a case-control study. Axelson and Raasch-Nielsen are studies
12:02:26 from Denmark and Sweden. So in Northern Europe, they don't --
12:02:33 they don't deal with privacy the way we do. They have all
12:02:37 these databases. Basically, your bank account number is the
12:02:41 same as your Social Security number that's based on your home
12:02:44 address, and they have these huge databases that are really
12:02:47 complete. So everyone in those countries, all their medical
12:02:50 diagnoses, what they worked on -- some of them actually, if
12:02:54 there's blood levels or urine levels of TCE, that's in these
12:02:58 databases. So these papers have really complete data.
12:03:02 And you could see that between Denmark and Sweden,
12:03:06 depending on which groups they were shown -- they were doing --
12:03:08 it's nothing to do with the country, but which groups they were
12:03:11 looking at, that they had that increased risk.
12:03:15 Morgan was aircraft workers in Arizona, where they were --
12:03:22 where they used a lot of TCE there.
12:03:25 Q. And what did the -- in the -- in the Morgan 1998 study
12:03:30 involving the aircraft workers that you just referenced, what
12:03:33 relationship did the researchers in that study find between TCE
12:03:37 exposure and renal cell carcinoma?
12:03:41 A. There was -- there was -- well, I think that one
12:03:43 actually -- that one may have combined both the renal cell and
12:03:47 the urinary tract. But that was the one where I mentioned they
12:03:51 also had contamination on site of the drinking water and

12:03:54 showers and that sort of thing. So it's sort of like Camp
12:03:56 Lejeune on steroids, and that one didn't have the increased
12:04:00 risk.
12:04:01 Q. So there wasn't even an increased risk of kidney cancer in
12:04:04 that study?
12:04:04 A. Right. And when you -- so when you look at all of these
12:04:08 and you look at the Bove publications at Camp Lejeune that did
12:04:11 not show the increase, it makes sense because the levels at
12:04:16 Camp Lejeune are numerically thousand-fold lower.
12:04:20 But, actually, when you inhale versus drink, your body
12:04:25 handles these exposures differently. So when we were talking
12:04:29 about poison before, TCE in the drinking water, it goes from
12:04:34 the stomach to the liver, where it gets metabolized, so the
12:04:38 liver basically takes care of all that, quote, unquote,
12:04:41 "poisons" and makes it not poisonous, whereas, when it's in the
12:04:45 air, it bypasses the liver and goes right to the kidneys and
12:04:48 cause damage.
12:04:48 So the ones on the right are really massive exposures
12:04:52 compared to Camp Lejeune. And that's why I keep saying when
12:04:55 you look at this data, it's pretty good reassurance about the
12:05:00 plaintiffs at Camp Lejeune.
12:05:01 Q. So in his report and in some charts that he presented
12:05:04 yesterday, Dr. Hatten represented to the Court that the
12:05:08 Charbotel study supports his opinions. Do you agree?
12:05:14 A. Only that TCE may be a cause of kidney cancer at the

highest level of exposure, but certainly not at Camp Lejeune levels.

Q. In his report and in his testimony yesterday, Dr. Hatten testified that the Raasch-Nielsen 2003 study supports his opinions. Do you agree?

A. Well, that was kind of a convoluted thing that should have been a red flag. What he said was that the risk estimate, how much the increase was from Raasch-Nielsen, was similar to the -- to the things that he pulled out of the supplement to the mortality study. That's a major red flag because if you have an exposure that's a thousand-fold higher, your risk should be a thousand-fold higher. But he said, well, look, they're the same, so that's how I'm -- you know, that's showing my corroboration, but he should have understood that that actually refuted his opinion.

Q. Dr. Hatten said in his report and then testified yesterday that the Morgan 1998 study supports his opinion. Do you agree?

A. No. There was no statistical increases in that study.

Q. Okay. Now, there was also testimony yesterday about the Andrew 2022 opinion. Are you familiar with that -- I'm sorry -- study? Are you familiar with that study?

A. So that was another one he said that -- that supported his opinion. So the Andrew study was from Dartmouth University, New Hampshire, where they looked at people who came to their medical center, their medical system, with kidney cancer, which

12:06:41 is not all the people who had kidney cancer in New Hampshire.
12:06:45 And they actually had maps for PCE exposure in the
12:06:52 groundwater, okay? So you can get contamination in the
12:06:55 groundwater. That doesn't necessarily mean it's in the
12:06:57 drinking water. But what they reported was that there was an
12:07:00 increased risk of kidney cancer with contaminated groundwater,
12:07:04 but there was two or three fundamental problems.
12:07:09 It's a good paper. It's an ecological study. It is -- it
12:07:12 is what it is. But the authors specifically said groundwater
12:07:16 contamination in their study may not be the same as drinking
12:07:19 water, that people actually use public water supplies, and they
12:07:24 didn't know who, okay? And so for exposure, how that relates
12:07:30 to Camp Lejeune where it was all drinking water and in the
12:07:32 Andrew paper, we don't know what they -- their actual exposure
12:07:35 was, other than groundwater, that's one problem.
12:07:37 The second problem, which is just as important, is that
12:07:42 Dr. Hatten cherry-picked the middle level of exposure. So they
12:07:46 put people at low, medium and high, and at the medium level
12:07:51 there was a statistically significant association, but not at
12:07:54 the highest level.
12:07:55 So if you were at the 50th percentile, if you were in sort
12:07:59 of the middle of the exposure, you had an increased risk, but
12:08:01 if you had a 75 percent level of exposure, you didn't have the
12:08:06 risk. That violates dose response. That's sort of that --
12:08:09 that checks and balances to say whether your associations are

12:08:13 due to chance, bias and confounding or are real. And because
12:08:17 Andrew didn't have a dose response, that should have been
12:08:20 weighed really low and really, quite frankly, does not his --
12:08:22 support his opinion.
12:08:24 Q. All right. So I want to refer -- I want to direct your
12:08:25 attention back to this chart. Do you see -- do you see the
12:08:30 marking "CL Water" here?
12:08:33 A. Yes.
12:08:33 Q. What does "CL Water" refer to?
12:08:35 A. That's the -- that's the Camp Lejeune water. Now, we're
12:08:38 looking at TCE, but, of course, Camp Lejeune people, the
12:08:43 plaintiffs, were exposed to all of the water, but this is just
12:08:46 a TCE thing. My point here is that you can see the arrow for
12:08:52 Camp Lejeune water, but -- but that's actually not drawn to
12:08:56 scale. My first try at that was literally less than a flat
12:09:00 line, if that's possible, and I felt like no one could see it.
12:09:03 So at least we have that sort of little, tiny placeholder. But
12:09:07 it's at least a thousand-fold less numerically than the studies
12:09:10 that show increased risk.
12:09:12 Q. Yeah, Dr. Shields, how did the exposure levels of TCE and
12:09:16 each of these studies that we just reviewed, how do they
12:09:19 compare to the TCE exposure levels in Camp Lejeune drinking
12:09:23 water?
12:09:24 A. Well, as I said, because it's drinking water versus air,
12:09:28 drinking water gets detoxified by the -- by the liver, not a

12:09:32 hundred percent, but more than enough so that it's almost all
12:09:36 of it, and that you -- the inhalation is a much more dangerous
12:09:41 method. And in there, in those occupational studies, we know
12:09:45 which studies are positive and which ones aren't.
12:09:48 Q. So the exposure levels of TCE in the Camp Lejeune drinking
12:09:50 water are way, way smaller than even the studies that found no
12:09:58 increased risk of kidney cancer in those occupational studies?
12:10:01 A. I mean, numerically, it's a thousand-fold less, but based
12:10:05 on physiology and how the body metabolizes -- so EPA in 2011
12:10:12 actually did a formula for how you convert air to drinking
12:10:16 water, and that makes this almost 30,000-fold less, not just a
12:10:20 thousand-fold less. I mean, it's a trivial exposure compared
12:10:23 to the studies that show an increased risk of TCE with renal
12:10:27 cell cancer.
12:10:29 Q. All right. Dr. Shields, several of plaintiff's witnesses
12:10:31 have testified that Marines were poisoned by the water at Camp
12:10:35 Lejeune. Based on the epidemiological science and the concept
12:10:39 of dose response, do you agree with that characterization?
12:10:43 A. No, because, again, we have these protective mechanisms.
12:10:46 This would get metabolized out. If I had learned 20 years
12:10:50 later that, you know, me and my family were there, I would not
12:10:54 be concerned in any way.
12:10:55 Q. Dr. Shields, several of plaintiff's witnesses have
12:10:58 testified that the chemical exposure levels at Camp Lejeune
12:11:01 were extremely high or intense. Based on the epidemiological

12:11:07 science, do you agree with that characterization?
12:11:09 A. Well, extremely high and intense is extremely vague, okay?
12:11:13 So it's compared to what? And so if you compare it to the
12:11:17 occupational studies, it's really a trivial level.
12:11:21 Q. Okay. Dr. Shields, now, these chemicals have been studied
12:11:25 for a long time. Have agencies like the National Research
12:11:28 Council, International Agency for Research on Cancer,
12:11:32 Environmental Protection Agency and others studied these
12:11:35 chemicals and their potential association with kidney cancer or
12:11:39 renal pelvis carcinoma?
12:11:40 A. Yes.
12:11:42 Q. Can you please summarize the findings of the agencies for
12:11:43 the Court?
12:11:45 A. Well, so there's a general consensus for TCE causing renal
12:11:51 cell cancers. None of them find credible associations for
12:11:56 renal pelvis urinary tract cancers. And I will note that
12:12:02 the -- so we're talking about Environmental Protection Agency,
12:12:04 the Agency for Toxic Substances Disease Registry, which also
12:12:10 included the Bove assessment, EPA, National Toxicology Program.
12:12:14 The one that's sort of the outlier to the group, which is
12:12:21 interesting, is the National Academy of Medicine. They were
12:12:23 tasked to actually study whether or not Camp Lejeune water
12:12:28 levels were associated with any cancers, and they actually said
12:12:33 that there was insufficient human evidence for TCE causing
12:12:37 kidney cancer. So there they had the specific focus on Camp

12:12:40 Lejeune and went against the consensus for the other agencies.
12:12:46 Q. Dr. Hatten testified that the findings of these agencies
12:12:49 support his opinions. Do you agree?
12:12:52 A. I don't see how. For benzene, vinyl chloride and PCE,
12:13:00 none of them have made any -- even remarked on -- credible
12:13:05 associations. For TCE and renal cell cancer, as I -- as I
12:13:12 mentioned, it depends on the dose because dose matters. Those
12:13:14 agencies don't particularly look at dose. That's -- you know,
12:13:18 that's for others to do. That's, for example, what we're doing
12:13:21 here in the courtroom.
12:13:23 Q. Okay. Now, Dr. Shields, since -- since the NRC and IARC
12:13:28 and the EPA published those analyses that you just reviewed,
12:13:32 have epidemiologists continued to study and publish research
12:13:37 regarding the contaminants in the Camp Lejeune water and any
12:13:40 possible connections to renal cell carcinoma or renal pelvis
12:13:45 carcinoma?
12:13:45 A. Yeah. So Dr. Hatten appropriately said that he's also
12:13:52 looked at publications after these agencies have done their
12:13:55 reviews, and that's appropriate to do, but the problem is, is
12:13:59 that, you know --
12:14:00 Oh, she's going to the demonstrative.
12:14:03 So on the left, there's -- is the agency reports. I
12:14:20 independently evaluated the data, but that's the baseline.
12:14:23 Since then, there's been three papers for benzene and two for
12:14:26 vinyl chloride, three for PCE and six for TCE. So there's a

lot more studies coming out. They haven't changed any of these determinations for, you know, benzene or vinyl chloride or PCE or TCE. And, again, these are all occupational studies of high levels of exposure.

Q. All right. Now, Dr. Shields, do you recall yesterday that Dr. Hatten testified about the scientific studies about the Camp Lejeune population itself?

A. Yes.

Q. All right. Do you agree that these studies are -- do you agree with Dr. Hatten that these studies are very important to understand general causation in this case?

A. So, yeah, but I just want to put an asterisk on that. They are very important, but the occupational studies are also very important, and they give you a different context. So both are very, very important.

Q. Okay. So are you familiar with the ATSDR's publications about the Camp Lejeune population?

A. I think we have the wrong demonstrative up.

MR. BAIN: Yes.

Q. We do, indeed.

MR. GUYNN: I apologize, Your Honor. We appear to have misplaced a set of these slides.

THE WITNESS: So should we just move on?

MR. GUYNN: No, I don't think we should.

(Brief pause.)

MR. GUYNN: Would you mind reading back the question?

(The court reporter reads back the question.)

A. So Dr. Bove and coworkers have published four peer-reviewed papers, two of them in 2014, two of them in 2024. So anything -- and the 2024 is what the important ones are because those are updates of 2014. And what he did is two papers, one on cancer incidence, and one on cancer mortality. So incidence is whether people get cancer, and mortality is whether they die from cancer, and they both give different types of evidence.

In both cases, these are -- no epidemiology study is definitive. They're not perfect studies. But they are really large studies, and if there's any chance that we could have found out that Camp Lejeune drinking water was causing kidney cancer, these would be the studies that do it. And, in fact, virtually every association, except for something that's buried in the supplement, showed no statistical increase. I mean, that's a critical -- that's a critical thing to understand. They're big studies, and if anything was going to show that Camp Lejeune was causing risk, it would be these.

Q. All right. Dr. Shields, can you tell the Court from these publications by the ATSDR, what do we know about the rates of kidney cancer in the Camp Lejeune population compared to the United States population in general?

A. So they did -- they cleverly did several different types of analyses. The first one was they looked at just people at

12:18:27 Camp Lejeune, how do their kidney cancer rates -- and in this
12:18:30 case, they combined kidney cancer and the renal pelvis, and
12:18:35 then they just did the renal cell cancer by itself. Compared
12:18:39 to the national rates, there was no increased risk of kidney
12:18:42 cancer for Camp Lejeune Marines and civilians.
12:18:48 Q. Okay. And then from these publications, what do we know
12:18:50 about the rates of kidney cancer when we compare side by side
12:18:54 the Camp Lejeune population and then the Camp Pendleton
12:18:58 population?
12:18:59 A. Right. So that was a clever analysis by looking at a --
12:19:01 what was -- what was thought to be an equivalent population.
12:19:05 The statistics clearly show that there was no increased risk.
12:19:09 Dr. Hatten was talking about all the numerical increases. He
12:19:12 was talking about the ones from the mortality study. The
12:19:17 better quality incidence study -- and these are ranked in terms
12:19:19 of quality -- show the numbers are all over the place. Some
12:19:22 went up, some went down, but the point is, is that there were
12:19:25 no statistical increases.
12:19:29 Q. Dr. Shields, from these publications, what do we know
12:19:32 about the rates of kidney cancer for different exposure levels
12:19:35 of people to the water at Camp Lejeune?
12:19:39 A. So the bottom one is really the best type of analysis,
12:19:42 which is if you're on Camp Lejeune for a longer period of time,
12:19:46 are you going to have more kidney cancer risk? The answer is
12:19:50 no. Dr. Hatten said, well, gee, the numbers are numerically

12:19:54 going up, but those are all coin-toss numbers, and when we --
12:19:57 when we show it, they're actually very flat numbers.
12:20:01 Q. Dr. Shields, were the sample sizes used in the Bove
12:20:06 publications sufficient to find statistically significant
12:20:10 results?
12:20:11 A. So the short answer is yes. It depends on the magnitude
12:20:13 of effect, but they were certainly big enough to be powered
12:20:17 based on occupational studies that if something was there, it
12:20:20 should have been pretty clear, especially with the update for
12:20:23 people, you know, many, many years after being exposed to the
12:20:27 Camp Lejeune water.
12:20:28 Q. But these studies didn't find that, did they?
12:20:30 A. Correct.
12:20:32 Q. Dr. Shields, do you recall that Dr. Hatten testified
12:20:36 yesterday that the Bove mortality study showed 20 percent
12:20:40 higher mortality rate when comparing Camp Lejeune Marines to
12:20:44 Camp Pendleton Marines and a 40 percent higher mortality rate
12:20:48 when comparing Camp Lejeune civilians to Camp Pendleton
12:20:52 civilians?
12:20:52 A. Yes.
12:20:53 Q. Can you please explain to the Court how you interpret
12:20:55 those figures in Bove?
12:20:57 A. Well, so what happens is, you get your data together, you
12:21:02 decide what's important, you publish it as peer review. And
12:21:06 then, because of the world of the internet and electronics, you

also throw out all your other -- you also put out all your other analyses.

So the body of the paper, what Dr. Bove thought was important and what was important, there's no increase. What Dr. Hatten was talking about was in the supplement, which is not something that's peer reviewed, but just data out there, the supplement had three different numbers that were statistically significant. What Dr. Hatten didn't mention was the checks and balances for the dose response was that there was no dose response. So those were chance finding.

And when you do, you know, 20, 30 different analyses by chance alone, some of them would be statistically significantly positive, and not only that, but it was -- it was the lower-quality analysis for that study. And that was written in the paper as, like, that's why it's in the supplement, because it's the less reliable analysis. The better analysis was no increase.

Q. Okay. Dr. Shields, are you aware that Dr. Bove -- and Dr. Hatten mentioned it yesterday -- are you aware that Dr. Bove prepared a report in 2018 on the Camp Lejeune population?

A. Yes.

Q. Did you review that report?

A. Yes.

Q. Why did you not include this survey on the slide that we

12:22:33 just had with other Bove publications from 2014 and 2024?
12:22:40 A. Multiple reasons. First of all, it was never peer
12:22:44 reviewed, and that's critical to the process. But what's even
12:22:47 more important and more interesting is the reason why it was
12:22:50 never submitted to a publication is that Dr. Bove testified
12:22:53 that while they had good intent for the study, the study was
12:22:58 actually pretty crappy, and so he didn't feel like it was
12:23:01 worthy of putting it out there and communicating the results.
12:23:04 He had to put it up on the internet. That's what ATSDR
12:23:07 does. But that's not the same thing as peer review. That's
12:23:09 not the same thing as publishing. And the reason why is they
12:23:12 had good intent for the study, but how the study was actually
12:23:16 implemented was really low quality. They had bad response
12:23:19 rates. They didn't know whether people really got cancer or
12:23:24 not. There's just, you know, numerous different -- different
12:23:27 problems, such that even Dr. Bove, who had all the incentive in
12:23:30 the world to try to publish his data, decided it wasn't good
12:23:34 enough.
12:23:34 THE COURT: How much longer is this going to go on?
12:23:37 MR. GUYNN: Your Honor, I am -- will be more than --
12:23:38 THE COURT: You can't have any more material, do you?
12:23:43 MR. GUYNN: Your Honor, frankly, to plumb the depths
12:23:45 of Dr. Hatten's confusion and error, it will take some more
12:23:49 time, but I'm trying to move this as quickly as I possibly can.
12:23:51 THE COURT: I don't think so. I think you're

dragging it along.

MR. GUYNN: Respectfully, Your Honor, I'm trying to show you all of the ways in which the testimony that you heard yesterday is unreliable and inconsistent with what all the federal agencies have said about these chemicals.

THE COURT: All right. You know, read the room. I'm the finder of fact. If you're getting criticism from me, that's maybe not good.

MR. GUYNN: I appreciate that, Your Honor. I am going to --

THE COURT: Just read the room, yeah.

MR. GUYNN: I'm going to move as quickly as I can. I do appreciate that, Your Honor.

THE COURT: I mean, that's essential.

MR. GUYNN: I agree. Thank you.

THE COURT: At the end of this, all of this, I'm going to make a decision. Now, if you've alienated me because of the way you've tried the case, you might not get a good outcome.

MR. GUYNN: I understand that, Your Honor.

THE COURT: No, I don't think you do.

MR. GUYNN: Well, I also have an obligation to inform you.

THE COURT: Okay. All right, let's go. Go ahead.

MR. GUYNN: All right. Let's move -- let's -- we'll

skip the next two slides.

Q. (By Mr. Guynn) All right. Dr. Shields, are you familiar with the report published in 2017 entitled "Assessment of the evidence for the drinking water contaminants at Camp Lejeune and specific cancers and other diseases"?

A. Yes.

Q. Have you analyzed that 2017 ATSDR assessment?

A. Yes.

Q. What did the author of that assessment evaluate in that report?

A. So Dr. Bove was charged with coming up with the framework for causation to be used for presumptive disability for veterans to give the veterans the benefit of the doubt, and he specifically testified to that. So he developed this framework very nonconventional, not actually used anywhere else by the ATSDR or EPA or NTP.

And this is important because Dr. Hatten's report and deposition testimony was very clear that this is what he was using. No one could read those reports as -- he did it two ways. This is the way he did it: He used the Bradford Hill to feed into it, which is actually a backwards process.

Q. Is the methodology that Dr. Bove used in this report typical in epidemiological science?

A. Well, it's in -- in causation analysis, no. So on the left here is the IARC panel that was developing causation

12:26:40 methodology for the International Agency for Research on
12:26:43 Cancer. That's a photograph of the number of people from 2022
12:26:46 who got together in France to do this, as opposed to Dr. Bove,
12:26:50 who said he had peer review. He couldn't remember who it was,
12:26:53 and he said one guy liked it and one guy didn't.
12:26:56 Q. Okay. Dr. Shields, let's turn to your second overarching
12:27:02 critique now with Dr. Hatten's opinions. Do you recall that
12:27:06 Dr. Hatten testified that he applied two methodologies, a
12:27:10 causation methodology based on a reduced at least as likely as
12:27:14 not standard and a traditional general causation methodology?
12:27:18 A. Yes.
12:27:19 Q. What improper causation methodology did Dr. Hatten apply?
12:27:23 A. Well, it's -- the improper methodology was his concept of
12:27:29 at least as likely as not, which is not a thing in science.
12:27:33 It's not a thing in public health, not a thing in medicine. It
12:27:35 was really taken from the ATSDR 2017, which is really a one-off
12:27:41 assessment.
12:27:43 Q. Why do you say that Dr. Hatten applied the at least as
12:27:46 likely as not, or equipoise, general causation methodology to
12:27:49 reap his opinions in this case?
12:27:52 A. That's what his report and deposition was very clear
12:27:55 about.
12:27:59 Q. Okay. Does Dr. Bove's use of a --
12:28:04 MR. GUYNN: Well, can you go to slide 20, please?
12:28:07 I'm going to skip a couple causation analysis slides.

12:28:11 Q. Dr. Shields, circling back to Dr. Bove's 2017 assessment
12:28:16 of the evidence, didn't Dr. Bove use equipoise and above to
12:28:21 characterize some of his findings?
12:28:23 A. Yeah. So he based that on a 2008 Institute of Medicine
12:28:29 report that was proposing ways of doing presumptive disability
12:28:34 for veterans, which is a very different context than what we're
12:28:37 doing today. So riffing off the 2008, he came up with this
12:28:42 assessment, which I said is really a one-off thing, which
12:28:46 subsequently got evaluated in 2022 by the National Academy of
12:28:50 Medicine and basically said, this concept of at least as likely
12:28:54 as not, an equipoise, is not scientifically valid and not
12:28:58 consistent with scientific consensus.
12:29:00 So Dr. Hatten didn't evaluate the framework that he think
12:29:03 he was -- he was using and didn't realize that this was
12:29:07 something that was later determined to be not consistent with
12:29:10 scientific consensus or -- or validated.
12:29:14 Q. All right. Dr. Shields, should -- should Dr. Hatten have
12:29:17 used this equipoise, or at least as likely as not standard in
12:29:20 his causation methodology?
12:29:22 A. He shouldn't have been because -- and, you know -- and, in
12:29:24 fact, you know, the Court basically said you can't lower your
12:29:28 standards. And so that's -- that's why, you know, he came in
12:29:31 and said yesterday, "Well, I actually did two methodologies,
12:29:34 not just one."
12:29:36 Q. Okay. So I'm going to mark "improper causation

12:29:38 methodology" on this demonstrative.
12:29:39 MR. GUYNN: And, Your Honor, I've heard you loud and
12:29:41 clear. I'm going to -- I think I have less than -- I have ten
12:29:44 minutes or less left.
12:29:46 THE COURT: I didn't hear what you said.
12:29:47 MR. GUYNN: I apologize, Your Honor. I'm moving this
12:29:49 along as quickly as I can.
12:29:50 Q. Okay. Dr. Hatten, let's move on to your third -- I'm
12:29:56 sorry.
12:29:56 Dr. Shields, let's move on to your third critique of
12:29:59 Dr. Hatten's opinions. Why do you say that he failed to
12:30:05 rigorously evaluate the scientific evidence?
12:30:08 A. So even if he had an acceptable framework, even if he did
12:30:14 do two frameworks and he did do the Bradford Hill, you have to
12:30:20 take a look at how he did that systematic methodology and
12:30:22 weighing the evidence, and there were really fundamental flaws
12:30:25 in that process.
12:30:28 Q. Now, if you see -- and then there's the sub-bullet. You
12:30:31 say that he misrepresents the real-world Camp Lejeune data.
12:30:34 Why do you say that?
12:30:36 A. Well, because those publications that are, you know, quite
12:30:39 large and reasonable epidemiologic quality didn't show the
12:30:44 increased risk of kidney cancer, with the exception of three
12:30:48 cherry-picked results from a supplement.
12:30:51 Q. You also say in the next bullet point that he failed to --

12:30:55 that he failed to identify relevant and important studies and
12:31:02 evaluate them for chance of bias and confounding. Why do you
12:31:05 say that?
12:31:05 A. So what he did was -- the way we find papers -- the way we
12:31:12 start to find papers is going to a database by the National
12:31:15 Library of Medicine, and you put keywords in. And so he told
12:31:20 us what his keywords are, which were, for example, for benzene,
12:31:23 "benzene and kidney cancer." He said yesterday he's supposed
12:31:27 to use a broad methodology for searching, but he didn't because
12:31:31 he used the word "kidney."
12:31:32 If you go to this government database and put in "benzene,
12:31:35 kidney cancer," you get 100 papers. Not all of them are about
12:31:39 benzene and kidney cancer. What he should have done is
12:31:42 "benzene and cancer," in which case he would have gotten 4,319,
12:31:47 so 43 times the amount. Not all of them are relevant, but
12:31:53 4,300 papers to go through is a very manageable thing to make
12:31:56 sure you're getting the full body of evidence. And so in the
12:32:00 demonstrative, actually, that -- that's -- okay.
12:32:07 Q. So you say in this demonstrative that he ignored or missed
12:32:11 most of the occupational studies and cherry-picked others. Why
12:32:14 do you say that?
12:32:17 A. Because that's what happened. I mean, so here's -- here's
12:32:20 what he -- what he cited in his report. For benzene,
12:32:25 perchloroethylene, vinyl chloride and trichloroethylene, you
12:32:27 see 11, 13, 3 and 25, when the actual citations that he should

12:32:31 have evaluated were 66, so six times more benzene; 27, twice as
12:32:37 many, for perchloroethylene; five times as many for vinyl
12:32:41 chloride; and almost twice -- more than twice as many for
12:32:44 trichloroethylene.
12:32:45 So these are Dr. Hatten's cherry-picked papers, and then
12:32:49 in the tables he brought in to court, had cherry-picked from
12:32:52 the cherry-pick. So he really missed most of the papers that
12:32:55 would have informed his opinion. It's like building the house
12:32:59 of cards without the cards.
12:33:01 Q. Dr. Shields, do you recall that during his testimony,
12:33:04 Dr. Hatten walked the Court through several demonstrative
12:33:07 exhibits that he had prepared?
12:33:09 A. Yes.
12:33:10 Q. What's your assessment of whether those exhibits provide a
12:33:13 representative summary of the evidence regarding chemical
12:33:17 exposures and kidney cancer?
12:33:18 A. Well, they don't. It was a -- it was a small fraction of
12:33:21 the available evidence. And, in fact, a lot of those rows --
12:33:26 when I first looked at this, I'm like, wait, what's all this
12:33:28 information? And it turns out he was just doing redundant --
12:33:31 putting thing after thing after thing from the same study,
12:33:35 almost trying to imply that there's multiple positive results
12:33:39 when, for Camp Lejeune levels, he basically cited three things
12:33:44 from a supplement of the mortality study, ignoring the incident
12:33:48 study; he did the Andrew paper, which was not supportive from a

12:33:53 dose response; and he used this 2018 survey that was debunked
12:33:58 by Dr. Bove that was never published.
12:34:02 Q. Okay. Wrapping up, Dr. Shields, Dr. Shields, I want to --
12:34:07 I want to finish by returning to IARC, which is the Agency --
12:34:11 the International Agency for Research on Cancer. What is this
12:34:16 document and this demonstrative exhibit?
12:34:19 A. So the International Agency of Research on Cancer, through
12:34:21 their monograph program, evaluates any type of agent that may
12:34:27 cause cancer, and they classify it as a -- as sufficient human
12:34:31 evidence or limited human evidence. And so this is a
12:34:34 document -- it's a living document on their website that always
12:34:36 has their latest evaluations.
12:34:38 So it's a document that shows what they've decided is
12:34:43 sufficient for kidney cancer and limited evidence for kidney
12:34:46 cancer, which is the renal cell cancer, and then at the bottom
12:34:49 is the renal cell carcinoma.
12:34:50 What you can see here is that for the renal cancer at the
12:34:58 top, the renal cell cancer, they do include trichloroethylene,
12:35:01 which is driven by those studies at very high levels, okay?
12:35:06 But even for the limited evidence, you don't see benzene, PCE
12:35:11 and vinyl chloride. So that's a distinction from Dr. Hatten.
12:35:15 And then at the bottom is the renal cell -- I'm sorry --
12:35:19 renal pelvis urinary. You don't see TCE there. You don't see
12:35:25 benzene. You don't see PCE. You don't see vinyl chloride.
12:35:29 But what you do see among the two of them, the renal cell

12:35:32 cancers and the renal pelvis cancers, is tobacco smoking. So
12:35:37 tobacco smoking is a well-known cause of both the kidney cancer
12:35:41 and the renal cell cancer.
12:35:43 And, otherwise, you also see here that IARC is calling
12:35:46 these diseases out separately. So they're not the same disease
12:35:50 to be lumped together, as Dr. Hatten did, and that the causes
12:35:53 of these are very different, with the exception of a couple of
12:35:56 things, like tobacco smoking, but not TCE, benzene, PCE or
12:36:01 vinyl chloride.
12:36:02 Q. So in the International Agency for Research Cancer's
12:36:05 current publication, an agency whose findings Dr. Hatten said
12:36:08 support his opinions, their current finding is that
12:36:13 Dr. Mousser -- Mr. Mousser's illness, renal pelvis carcinoma,
12:36:17 cannot be caused by TCE?
12:36:19 A. Well, as a scientist, I will never say "cannot," but based
12:36:22 on the sufficient human evidence or even limited human
12:36:25 evidence, it's not there to make that conclusion, to look
12:36:28 anyone in the eye and say that "Camp Lejeune exposures caused
12:36:31 your kidney cancer."
12:36:35 Q. Dr. Hatten -- Dr. Shields, are each of your opinions based
12:36:38 on your specialized education, training and the peer-reviewed
12:36:40 scientific literature that you reviewed?
12:36:42 A. Yes.
12:36:43 Q. Have you expressed all of your general causation opinions
12:36:45 to a reasonable degree of scientific certainty?

12:36:47 A. Yes.
12:36:48 MR. GUYNN: Your Honor, the United States passes the
12:36:50 witness.
12:36:50 THE COURT: All right. We'll take a lunch recess now
12:36:53 until 1:45.
12:36:55 (Luncheon recess taken from 12:26 p.m. to 1:47 p.m.)
01:47:29 THE COURT: Are you finished with the witness?
01:47:29 MR. GUYNN: I am, Your Honor.
01:47:30 THE COURT: Any cross?
01:47:32 MR. SNIDOW: Yes, Your Honor.
01:47:33 THE COURT: Go ahead.
01:47:33 CROSS-EXAMINATION BY MR. SNIDOW:
01:47:33 Q. All right. Dr. Shields, am I correct you've testified
01:47:37 before?
01:47:37 A. Yes.
01:47:38 Q. And you're pretty good at it, aren't you?
01:47:41 A. I'll say yes, but that sounds kind of egotistical.
01:47:44 Q. Well, in fact, you've made millions of dollars testifying
01:47:47 as an expert witness; isn't that true?
01:47:49 A. Over about 25 years; that's correct.
01:47:50 Q. Including $600,000 in a single year, correct?
01:47:54 A. That's likely.
01:47:55 Q. You got a daily rate for your deposition, don't you?
01:47:57 A. Yes.
01:47:58 Q. And I believe that's $8,300; is that right?

01:48:02 A. I think that's for a full day of deposition. There's a
01:48:02 half-day rate as well.
01:48:02 Q. You got a rate for trial, correct?
01:48:08 A. It's the same rate.
01:48:09 Q. It's what?
01:48:10 A. The same rate.
01:48:10 Q. Oh, so today, you are going to make $8,300 testifying on
01:48:16 behalf of the United States; is that a fact?
01:48:18 A. It depends on how long you take. It's either a half day
01:48:20 or a full day.
01:48:21 Q. Okay. I think it's going to be a full day, just so you
01:48:23 know.
01:48:23 A. Good news.
01:48:24 Q. Now, Dr. Shields, you kind of wiggled around this on
01:48:29 direct. Remember when you said you thought that we got the
01:48:31 wrong cancer? You said that, right?
01:48:33 MR. GUYNN: Objection. Argumentative.
01:48:33 THE COURT: Overruled.
01:48:33 Q. Did you say you thought that we had the wrong cancer?
01:48:37 A. For Mr. Mousser, yes, that's the wrong cancer.
01:48:41 Q. But the fact is, you would give the exact same opinion
01:48:46 about any one of the cancers in this entire litigation that
01:48:49 you've reviewed; isn't that true?
01:48:50 A. I'm going to --
01:48:53 Q. Is that true?

01:48:53 A. -- say yes. I mean, it depends on which specific exposure
01:48:56 and which specific cancer. So, for example, benzene and
01:49:01 leukemia would be somewhat different. It would be sort of like
01:49:03 the TCE and kidney cancer today, which is about dose matters.
01:49:07 Q. Well --
01:49:07 A. Everything else doesn't have any credible associations.
01:49:09 Q. Did you give a deposition in this case?
01:49:10 A. Yes.
01:49:11 Q. In that deposition, did you or did you not say that you
01:49:14 don't think that any of the exposures at Camp Lejeune have
01:49:18 caused any of the plaintiffs to develop kidney cancer?
01:49:21 A. That's what I said today as well.
01:49:23 Q. Okay. And did you also not say that your view is that the
01:49:27 exposures at Camp Lejeune are not sufficient to have caused any
01:49:32 of the cancers that are being complained of?
01:49:34 A. Yes, and that's consistent with my testimony today.
01:49:37 Q. All right. So it doesn't matter. We could have been in a
01:49:39 bladder case; your opinion would still be "not sufficient,"
01:49:41 correct?
01:49:42 A. Yeah, because of the levels of exposure at Camp Lejeune
01:49:45 don't amount to any concerns.
01:49:47 Q. Leukemia, non-Hodgkin's lymphoma, Parkinson's disease;
01:49:49 your opinion is exactly the same, just not enough of the
01:49:52 chemicals; is that right?
01:49:53 A. So I'm going to clarify that because I don't have any

01:49:56 opinions about Parkinson's disease.
01:49:57 Q. Oh, fair enough. For the cancers; is that right?
01:49:58 A. Sorry?
01:49:58 Q. For the cancers, what I said is correct?
01:50:01 A. That's correct.
01:50:01 Q. All right. Now, it's not the first time in a litigation
01:50:05 that you've given exactly that kind of opinion, that the
01:50:07 exposures just aren't high enough, right?
01:50:10 A. Sure. When that's appropriate for that type of
01:50:12 litigation, yes.
01:50:12 Q. All right. Now, you have testified in tobacco cases for
01:50:15 the plaintiffs, correct?
01:50:16 A. Correct.
01:50:16 Q. You have testified that meso- -- or asbestos does cause
01:50:20 mesothelioma, correct?
01:50:21 A. Correct.
01:50:21 Q. But aside from those two examples, you have never once
01:50:25 testified that the exposure levels at issue caused cancer,
01:50:29 true?
01:50:30 A. I've been called and asked many times. When they hear
01:50:34 what my opinions are, how I approached the case, I don't get
01:50:36 retained in those cases, including for you guys when you
01:50:39 reached out to me to see whether I'd be an expert on your side.
01:50:42 Q. Yeah, focus on my question, though. You have said that
01:50:44 the exposure levels cannot cause cancer. You've given that

01:50:47 opinion, right?
01:50:49 A. Depending on the circumstance, that's correct. That's
01:50:50 correct.
01:50:50 Q. And my question is outside of mesothelioma and tobacco,
01:50:54 you've never given the opinion that the exposure levels can
01:50:57 cause cancers, true?
01:50:58 MR. GUYNN: Objection. Asked and answered, Your
01:50:58 Honor.
01:50:58 THE COURT: No. Denied.
01:51:04 Q. Is that right?
01:51:06 A. For all the cases that I could think of, that's correct.
01:51:09 Q. Okay. Now, you made this -- this slide deck, right? You
01:51:13 made that?
01:51:14 A. Yes.
01:51:14 Q. Have you ever used that deck before?
01:51:16 A. Have I ever used -- sometimes -- some of those slides I
01:51:18 probably have used. A lot of them are brand-new.
01:51:20 Q. Okay. And I imagine you've used some of the examples that
01:51:23 you told the Court about to illustrate some of the scientific
01:51:26 concepts. You've -- you've used those examples before?
01:51:28 A. Sure. I'm not reinventing the wheel.
01:51:30 Q. Right. So, like, this slide, I bet you've used this one
01:51:32 before, right?
01:51:34 A. Actually, no, I've never used that.
01:51:36 Q. Okay. I thought it was interesting. So you were -- you

were trying to, I assume, explain to Judge Boyle what statistical significance is, right?
A. Yes, as well as that slide would have been used for equipoise, how we'd gotten there.
Q. And I think you were telling Judge Boyle that the epidemiology, looking at Camp Lejeune, it was just kind of a coin flip, random chance; is that right?
A. That's right.
Q. Okay. So I've got a coin. It's a quarter.
A. Okay.
Q. Now, I think you and I will both agree if we flip this coin, the chance of it coming up heads is 50-50, right?
A. Yeah, sure.
Q. Yeah. And I think you and I both agree if that coin comes up heads, no evidence at all that there's anything unusual about the coin, it being a loaded coin; is that right?
A. Yeah.
Q. I think we can both agree if you flip that coin and it comes up heads 15 times, you're pretty darn sure there's something going on with that coin, right?
A. It's pretty likely. I mean, that could be still chance, but it would -- you would conclude that there's probably an issue with the coin.
Q. Yeah, it's, I mean, 1 over 2 to the 10th, right? It's a pretty low probability; is that right?

01:52:42 A. That's right.
01:52:42 Q. Is that correct?
01:52:44 A. Yes.
01:52:45 Q. Yes. I thought so. Okay. Now, Dr. Shields, on direct
01:52:51 examination, I believe that you said that Dr. Hatten is the one
01:52:56 who is in conflict with international scientific consensus,
01:52:59 correct?
01:53:00 A. Correct.
01:53:00 Q. Okay. Now, you know that the Government in this case has
01:53:05 admitted that the evidence proves that TCE can cause kidney
01:53:09 cancer, right?
01:53:10 A. I don't know what they might have admitted in terms of can
01:53:13 cause or not.
01:53:14 Q. You don't believe that, though, do you?
01:53:15 A. No. When I evaluated the evidence, just like many other
01:53:19 of my colleagues, there's probably insufficient human evidence
01:53:22 for TCE causing kidney cancer.
01:53:23 Q. So, sorry, you -- you do not believe that there's
01:53:26 evidence -- sufficient evidence that TCE --
01:53:27 A. That's right.
01:53:27 Q. -- is that correct?
01:53:29 A. I'm in agreement with the many other learned scientists
01:53:32 that TCE is not a cause of kidney cancer, based on the
01:53:35 available evidence.
01:53:36 Q. Oh, you're in agreement with other learned scientists on

that?
A. That's right.
Q. Okay. You're familiar with the International Agency for the Research on Cancer?
A. Yes.
Q. They publish monographs on various substances?
A. That's correct.
Q. As you can tell here, those monographs are, like, a thousand pages long, right?
A. They can be.
Q. They can be. And you know that they have a whole monograph looking at TCE, PCE and some other chlorinated agents, right?
A. Yes. They have a separate monograph on TCE as well.
Q. Yep. And you know, Dr. Shields, that the International Agency for the Research on Cancer says that TCE causes kidney cancer, right?
A. As a majority vote, yes, and a minority that said it didn't.
Q. Oh, the majority said?
A. The majority voted for it, and a minority, based on transparency and its quality of the evidence --
Q. Yeah.
A. -- said that they didn't believe that TCE causes kidney cancer, and I am in agreement with that.

01:54:31 Q. You're agreeing with the minority on that?
01:54:33 A. Correct.
01:54:34 Q. All right. Now, is the International Agency for the
01:54:34 Research on Cancer, is that the only organization that says
01:54:40 that TCE causes kidney cancer?
01:54:42 A. No. We talked about this earlier. EPA, NTP, AC -- I
01:54:48 don't know about ACGIH, but the National Academy of Medicine,
01:54:51 for their 2009 report, said that it did not.
01:54:55 Q. Okay. You disagree, I guess, with ATSDR, EPA, National
01:55:03 Toxicology Program and, of course, the International Agency for
01:55:06 the Research on Cancer? All of them say sufficient evidence
01:55:12 that TCE causes kidney cancer. You, Dr. Shields, say no,
01:55:16 correct?
01:55:17 A. That's right, as well as the National Academy of Medicine
01:55:18 and many other scientists.
01:55:20 Q. And, in fact, you were retained in a previous case called
01:55:23 *Adams* where you gave that exact opinion, correct?
01:55:27 A. It's not ringing bells, but it would be consistent with my
01:55:30 opinions today.
01:55:31 Q. Okay. Now, I think you didn't really mention that in
01:55:35 direct, but I do believe you told Judge Boyle that the problem
01:55:39 is that the dose of TCE is just too low; is that right?
01:55:43 A. That's right. What I said is that for the purposes of
01:55:45 this trial --
01:55:46 Q. And I assume --

01:55:46 A. Can I finish? For the purposes of this trial, I'm looking
01:55:52 at dose, as TCE, as it may cause kidney cancer because of the
01:55:57 scientific consensus that TCE may cause kidney cancer.
01:56:00 Q. Okay. Did you -- did you make this slide?
01:56:02 A. Yes.
01:56:02 Q. And I want to get a little closer because I want the Court
01:56:07 be able to actually see what you've done here. And I assume
01:56:10 you weren't trying to make this slide misleading, were you?
01:56:13 A. Of course not.
01:56:16 Q. Okay. And I think what you told Judge Boyle on direct was
01:56:20 that the evidence shows that below -- and what's the threshold
01:56:25 again? Below what level does TCE --
01:56:26 A. I don't know if it's below a specific threshold, but the
01:56:30 studies that are positive are sort of Raasch-Nielsen -- with
01:56:34 one exception of a paper by Moore of 2010, they're generally
01:56:37 more than 60 parts per million, as maybe as high as 885 parts
01:56:40 per million.
01:56:41 Q. Okay. So you said it's -- there's a threshold somewhere
01:56:44 in between?
01:56:45 A. That's -- so I don't like the word "threshold." That's
01:56:47 kind of a very specific meaning. What I'm going to say is
01:56:49 where it's measurably increased in a statistical association.
01:56:53 Q. You said the word "threshold" on direct, didn't you?
01:56:54 A. No.
01:56:54 Q. You didn't?

01:56:54 A. Not for this.
01:56:54 Q. Well, that's why I have a transcript. Now, let me ask you
01:56:59 this: What organization says that below, whatever number
01:57:04 you've chosen there, TCE doesn't cause kidney cancer?
01:57:07 A. None of those organizations give you a dose either way, so
01:57:09 it doesn't say it does or doesn't. But what they do is they
01:57:12 identify the high-quality studies that drive their opinions,
01:57:15 and that's the Raasch-Nielsen, Charbotel and a couple of other
01:57:18 papers.
01:57:19 Q. Okay. So let's talk about that. Charbotel is a study
01:57:21 done in France. You mentioned that in direct, correct?
01:57:23 A. That's right.
01:57:24 Q. And they looked at people who were exposed to TCE in a
01:57:28 factory, correct?
01:57:30 A. Correct.
01:57:31 Q. And they measured TCE exposure by giving kind of a job
01:57:35 certain, right?
01:57:37 A. That's my recollection.
01:57:38 Q. And they said, you know, where did you work in the
01:57:39 factory; let's get a sense for how much TCE you were exposed
01:57:41 to, correct?
01:57:43 A. That's right.
01:57:43 Q. And no question about it, the Charbotel study showed an
01:57:46 increased risk for people who were exposed to the highest
01:57:49 amounts of TCE, correct?

01:57:50 A. That's correct. At the highest level, you are correct.
01:57:52 Q. All right. And then I think what you were saying is the
01:57:54 Camp Lejeune water, it's a lot less than Charbotel, correct?
01:57:58 A. Trivial amounts, yes.
01:57:59 Q. Now, here's my question for you, Dr. Shields: On your
01:58:03 chart here, do you include any studies that actually did look
01:58:08 at exposure levels similar to the water at Camp Lejeune?
01:58:12 A. No. This is an occupational comparison to Camp Lejeune.
01:58:17 Q. Oh. And, in fact, there -- there are studies that look at
01:58:21 exposures in water contamination and other places that are
01:58:24 similar to Camp Lejeune, right?
01:58:25 A. Well, we did discuss the Andrew paper. Then there's a TCE
01:58:28 Aschengrau paper.
01:58:30 Q. Talking about your slide right now, did you put Moore 2010
01:58:32 on this slide?
01:58:33 A. No.
01:58:33 Q. Did put Raasch-Nielsen 2003 on this slide?
01:58:36 A. Yes.
01:58:37 Q. Okay. Did you put Bove 2014 on this slide?
01:58:41 A. No. Bove 2014 is an old paper.
01:58:44 Q. Uh-huh. Did you put Andrew on this slide?
01:58:46 A. No. Again, this is an occu- -- if you look at the title,
01:58:48 the Camp Lejeune levels are far below the occupational TCE
01:58:51 exposure levels in research.
01:58:53 Q. Yeah. Did you put the Aschengrau study on this slide?

01:58:56 A. That's not an occupational study.
01:58:57 Q. Any of the studies from Woburn?
01:58:59 A. That's not an occupational study.
01:59:01 Q. I understand, but you understand why I'm asking. You said
01:59:04 these studies are way above Camp Lejeune.
01:59:05 A. Right.
01:59:05 Q. There are studies that look at levels like Camp Lejeune,
01:59:07 and you didn't put them on the chart, right?
01:59:09 A. Yeah. And --
01:59:09 Q. Yeah.
01:59:09 A. -- those studies are consistently showing no increase, so
01:59:13 they wouldn't be appropriate to put on here.
01:59:16 Q. Really? Your testimony is all the water studies
01:59:20 consistently show no increase?
01:59:22 A. Well, let's go through them. The consistency across the
01:59:24 studies is no increase.
01:59:25 Q. Okay. So it sounds like there are some that do show an
01:59:27 increase, right?
01:59:28 A. Sure.
01:59:28 Q. Yeah.
01:59:28 A. There's always going to be studies there are positive by
01:59:30 chance alone.
01:59:31 Q. It's just not --
01:59:31 A. All of those studies are ecological -- ecological studies
01:59:34 that are considered very low-quality compared to the

01:59:37 occupational studies.
01:59:39 Q. Okay. Let's look at a few more of your slides. Now, you
01:59:41 showed the Court this slide, right?
01:59:51 A. That's correct.
01:59:54 Q. And I think you were trying to say that there aren't any
01:59:59 statistically significant increases in kidney cancer in any of
02:00:02 these studies, right?
02:00:04 A. That is absolutely not true. I did not say that.
02:00:06 Q. Oh. Well, it just says -- it says, "No statistically
02:00:09 significant increase in kidney cancer across studies," and then
02:00:11 you've got the four studies. Okay.
02:00:12 A. That's right. The consistency of those studies, there's
02:00:14 no consistent increase.
02:00:16 Q. All right. So with this slide, you weren't -- you weren't
02:00:18 trying to suggest to Judge Boyle that the four studies you
02:00:22 stuck on the top of the slide don't have statistically
02:00:27 significant increases?
02:00:28 A. So I hope I was clear earlier. The published studies, in
02:00:31 the -- in the bodies of the studies, are consistently no
02:00:35 increase. That -- one of the supplements is a mortality study,
02:00:38 which is the lower-quality study, as a supplement, has, like,
02:00:42 three positive results that are inconsistent with the dose
02:00:45 response.
02:00:47 Q. Okay. And I heard you say that, and then -- and then you
02:00:48 said something very interesting to me. You said the

02:00:51 supplemental tables are not peer reviewed. You said that,
02:00:53 right?
02:00:54 A. That's correct.
02:00:55 Q. Okay. Now, you know that the supplemental tables are
02:00:57 cited in the study, right?
02:00:58 A. That's right.
02:00:59 Q. Okay. The study is peer reviewed, right?
02:01:01 A. The main study is peer reviewed. The tables are provided
02:01:04 to the peer reviewers, but they don't get peer reviewed.
02:01:06 Q. Yeah, but in the main body of the study, it'll say, like,
02:01:08 "See Supplemental Table S2," correct?
02:01:11 A. That's right.
02:01:11 Q. And that goes to the peer review, correct?
02:01:13 A. That's right, as well as the supplemental tables, but
02:01:15 the -- but there's no peer-review process for supplemental
02:01:17 tables because they're just data.
02:01:19 Q. Yeah.
02:01:19 A. You don't peer review data tables.
02:01:21 Q. They're data tables that go to the peer reviewers, true?
02:01:23 A. They do go to the peer reviewers.
02:01:28 Q. Okay. Now, let's do this one. You showed this one.
02:01:42 A. Actually, we didn't show that, but I would love to talk
02:01:45 about it, if you'd like.
02:01:46 Q. Well, I think you said -- you said that there's no
02:01:49 monotonic dose response in Bove 2014, right?

02:01:52 A. I did say that.
02:01:52 Q. You did say that, right. And you've read Bove 2014, right?
02:01:55
02:01:57 A. Yeah. We're talking about the mortality, or we're talking about the incident study?
02:01:58
02:01:59 Q. We're talking --
02:01:59 A. Actually, we could talk about either.
02:02:03 Q. Well, just so you know, both Bove 2014 studies are mortality studies, right?
02:02:06
02:02:06 A. Say that again.
02:02:08 Q. Both Bove 2014 studies are mortality studies, correct?
02:02:14 A. That's correct.
02:02:15 Q. Okay. The difference is something different. The difference is one looks at Marines and one looks at civilians, true?
02:02:17
02:02:19
02:02:20 A. Right. I just want to make sure we're clear. This is -- okay, that's fine.
02:02:23
02:02:23 Q. Okay.
02:02:23 A. Because this is the water levels, yep.
02:02:25 Q. And your testimony is, in Bove 2014, no monotonic dose response, right?
02:02:31
02:02:31 A. That's correct.
02:02:32 Q. Okay. I'm approaching you with Plaintiff's 75. Now, Dr. Shields, this paper is peer reviewed, right?
02:02:35
02:02:46 MR. GUYNN: Your Honor, can we have a copy? Oh,

02:02:46 we've got it here. Apologies.
02:02:49 MR. SNIDOW: I hope you have it.
02:02:53 Q. This paper is peer reviewed, right?
02:02:54 A. That's correct.
02:02:55 Q. And right here, does it -- does it say, "Monotonic
02:02:59 categorical cumulative exposure trends were observed for kidney
02:03:01 cancer"? Is that what it says?
02:03:04 A. That's right.
02:03:14 Q. That's right. And you decided to show Judge Boyle a slide
02:03:20 that -- or in total, I guess, you would show it. You said,
02:03:22 "There's no monotonic dose response in the Bove 2014 study,"
02:03:26 right?
02:03:26 A. That's exactly right. By the statistical analysis, there
02:03:29 was no increase. And you could see, Judge, that this is an
02:03:33 extremely flat line. That's not -- those dots are not
02:03:36 increasing based on increasing levels of exposure. This is a
02:03:40 big enough study that if it was going to increase the kidney
02:03:42 cancer risk, we would see a graph that has a straight line up,
02:03:45 not flat.
02:03:46 Q. Hey, Dr. Shields, did the study author say what you just
02:03:48 read?
02:03:48 A. That's right.
02:03:49 Q. Okay. Now, let's look at -- you spent a long time
02:04:05 criticizing Dr. Hatten's Bradford Hill analysis, right?
02:04:07 A. That's correct.

02:04:08 Q. Now, this one caught my eye. You've read the Bradford Hill charts, right?
02:04:11 A. Of course.
02:04:13 Q. There are several factors that you should consider?
02:04:14 A. Yes.
02:04:17 Q. Okay. It was written in, was it 1965 --
02:04:20 A. More --
02:04:20 Q. -- Sir Austin Bradford Hill?
02:04:20 A. -- more or less.
02:04:21 Q. It's absolutely the seminal paper for evaluating causation in your field, right?
02:04:23 A. I don't know whether it's seminal, but it's pretty widely used.
02:04:26 Q. And you know, I mean, Dr. Hatten used the Bradford Hill, right? You weren't suggesting he didn't use it?
02:04:29 A. So he said he used it. He did not use it according to the way Bradford Hill wrote it or anyone else uses it.
02:04:32 Q. Okay. So we're going to go according to how Bradford Hill wrote it. You have the word "transparency" on this slide, right?
02:04:34 A. That's right.
02:04:37 Q. That's not a Bradford Hill factor?
02:04:39 A. That's correct.
02:04:40 Q. What'd you say?
02:04:45 A. That's correct.

02:04:51 Q. Okay. Now, I want to talk to you about one last topic
02:05:13 before -- maybe. I think on direct examination, you suggested
02:05:20 to Judge Boyle that the studies looking at Camp Lejeune show no
02:05:29 results, no difference between the people at Camp Lejeune and
02:05:31 the people at Camp Pendleton, right?
02:05:33 A. For the statistical analyses, that's correct, except for
02:05:35 the ones -- the three data points in the supplement, yeah.
02:05:42 Q. So let's start looking at them, I guess. I'm going to
02:05:46 start with Bove 2014a, which we just looked at.
02:06:04 MR. SNIDOW: Your Honor, this is Plaintiff's 76.
02:06:06 Q. And, Dr. Shields, if you'll go to the conclusion section
02:06:09 here. Let me know when what you're there.
02:06:18 A. Do you mean the discussion section, or?
02:06:19 Q. The conclusion section. It's on page 13.
02:06:23 A. Okay. I'm there.
02:06:24 Q. "The study found elevated HRs in the Camp Lejeune cohort
02:06:27 for several causes of mortality, including kidney cancer,"
02:06:30 correct?
02:06:30 A. Yes.
02:06:30 Q. Now, why don't you flip through that study, and you tell
02:06:33 me where the study authors, who were peer reviewed, say, our
02:06:38 study shows that there's no difference between the people at
02:06:41 Camp Lejeune and the people at Camp Pendleton?
02:06:43 A. Sure. That's pretty easy. The next sentence, "However,
02:06:45 the precision of many HR estimates was low, as indicated by

02:06:50 wide confidence intervals."
02:06:51 Q. That's --
02:06:51 A. That's saying that it's not statistically significant and
02:06:54 their findings were not positive.
02:06:55 Q. All right. Well, let's, I guess, flip the coin again and
02:06:58 see what we get in 2014b. I'm going to show you Exhibit 73.
02:07:07 This is another peer-reviewed paper, correct?
02:07:08 A. That's right.
02:07:10 Q. If you go to the conclusion section there, it says, "The
02:07:14 study found elevated HRs in the Camp Lejeune cohort for several
02:07:17 causes of death, including cancers of the kidney," correct?
02:07:23 A. That's correct.
02:07:24 Q. Okay. Now, take a look, flip through it and tell me where
02:07:27 do these study authors say, hey, our study actually shows that
02:07:32 there's no difference between the kidney cancer death rates at
02:07:35 Camp Lejeune and Camp Pendleton?
02:07:37 A. It's very clear. As part of the next sentence, it says,
02:07:40 "The number of cause-specific deaths was small, resulting in
02:07:44 wide confidence intervals." That means it was not
02:07:47 statistically significant, so that's a coin toss.
02:07:49 Q. Coin toss again?
02:07:50 A. That's right.
02:07:50 Q. All right. Well, let's flip the coin again. I'm showing
02:07:57 you Plaintiff's Exhibit 80. This is Bove 2024, correct?
02:08:09 A. That's right.

02:08:10 Q. And there's two, right?
02:08:11 A. That's right.
02:08:12 Q. This is the mortality, correct?
02:08:13 A. Correct.
02:08:14 Q. If we go to the results there, it says, "Compared to Camp
02:08:17 Pendleton Marines/Navy personnel, Camp Lejeune had HRs greater
02:08:21 than 1.20 with confidence interval ratios less than 3 for
02:08:26 cancers of the kidney," true?
02:08:27 A. That's right.
02:08:29 Q. Now, where in this study -- and flip through it -- do the
02:08:33 authors say, you know, we said all that, but, actually, what we
02:08:36 really meant was that there's no difference at all between the
02:08:39 Camp Lejeune Marines and the Camp Pendleton Marines?
02:08:41 A. Sure.
02:08:41 Q. Yeah.
02:08:41 A. So, first of all, they're doing their --
02:08:44 Q. Wait, sorry. First of all, Dr. Shields, do they say that
02:08:47 in that study?
02:08:47 A. I'm trying to answer your question.
02:08:48 Q. Please do. Do they ever say that in the study?
02:08:51 A. They're not using your exact words --
02:08:52 Q. Okay.
02:08:52 A. -- and I can explain why, but that's exactly what this
02:08:55 study says.
02:08:55 Q. You can put it aside.

02:08:56 A. Okay.
02:08:56 Q. Now, you talked --
02:08:58 MR. GUYNN: Your Honor, can he please answer the
02:08:59 question?
02:08:59 MR. SNIDOW: Your Honor, he answered the question.
02:08:59 This is cross.
02:08:59 THE COURT: Did you finish your answer?
02:09:02 THE WITNESS: No.
02:09:03 THE COURT: You can go ahead and answer.
02:09:06 THE WITNESS: Okay.
02:09:07 A. So in here, in the statistical methods, they -- they --
02:09:10 essentially, they provide the confidence intervals that are not
02:09:14 statistically significant, and then they go on and they say,
02:09:17 "Statistical" -- sorry -- "Statistical significance testing was
02:09:30 not used to interpret findings." So they didn't use them, but
02:09:33 they put the data in, and the data is not statistically
02:09:35 significant.
02:09:36 Q. Is that another coin flip, I guess?
02:09:37 A. I don't even know what you mean by another coin flip.
02:09:39 Q. I do.
02:09:40 A. It's chance -- it's chance findings. These are not
02:09:44 independent coin flips. This is one coin flip done in three
02:09:46 different papers.
02:09:47 Q. Okay. And then you talked about the ATSDR 2018 study,
02:09:50 correct?

02:09:51 A. Correct.
02:09:51 Q. And you said way too unreliable to even consider, true?
02:09:55 A. That's what the study author who did the actual study
02:09:59 said.
02:09:59 Q. All right. I'm going to show you what the ATSDR -- you
02:10:02 know what the ATSDR says, right?
02:10:04 A. Yes.
02:10:06 Q. What the ATSDR is, correct?
02:10:06 A. Yes.
02:10:06 Q. They're an arm of the federal government, these guys?
02:10:09 A. Correct.
02:10:09 Q. All right. I'm going to show you what they say on their
02:10:12 website today about that study. If you look down there in the
02:10:15 conclusions part, that says right there, it says, "This study
02:10:21 shows that contaminated drinking water at Camp Lejeune was
02:10:24 linked to increased risk for bladder cancer, kidney cancer and
02:10:28 kidney disease," correct?
02:10:29 A. So, I'm sorry, are -- did you represent that this was part
02:10:32 of the survey 2018, or are you talking about the more recent
02:10:36 Bove studies? I'm not sure what this document is.
02:10:38 Q. I'm telling you this is what ATSDR, the federal
02:10:41 government, says on their website today about this study.
02:10:55 A. Okay. Yes, that's what it says.
02:10:56 Q. That's what it says. Next page, top, "These results are
02:11:04 consistent with results found in previous studies," correct?

02:11:07 A. That's what it says.
02:11:16 MR. SNIDOW: No further questions, Your Honor.
02:11:23 THE COURT: Any follow-up?
02:11:23 THE WITNESS: I can't see you.
02:11:29 MR. GUYNN: Very, very few, Your Honor, but just --
02:11:36 THE COURT REPORTER: Sir, he can't see you.
02:11:36 MR. GUYNN: Oh, yeah. I'll go ahead and move these
02:11:37 out of the way, Your Honor.
02:11:38 Really quickly, Your Honor, just a couple of
02:11:52 questions, but before I do, I'd just like to move some
02:11:55 exhibits, try to admit them into evidence.
02:11:58 During his testimony, Dr. Shields referenced the
02:12:01 National Research Council 2009 study, and that's been marked as
02:12:05 U.S. Exhibit 84. He also referenced the ATSDR's 2017
02:12:10 assessment of the evidence. That's U.S. Exhibit 238. And then
02:12:16 we've marked for Your Honor Dr. Shields's demonstrative
02:12:17 exhibits as U.S. Exhibit 2021. [sic] I'd move to admit those
02:12:23 into the record.
02:12:24 THE COURT: They're received.
02:12:24 MR. GUYNN: Thank you, Your Honor.
02:12:24 (Defendant's Exhibit Numbers 84 and 238 received.)
02:12:24 MR. GUYNN: Thank you, Your Honor.
02:12:26 REDIRECT EXAMINATION BY MR. GUYNN:
02:12:26 Q. Really quick, Dr. Shields, there were some questions about
02:12:31 flipping a coin. When you're saying that a study is not

02:12:37 statistically significant, are you saying, the way that maybe
02:12:41 Dr. Hatten would, that it's at least as likely as not that that
02:12:45 study is probative of the question that we're looking at?
02:12:50 A. No, and, actually, statistical significance is not
02:12:53 flipping the coin at 50-50. It's at a 95 percent probability
02:12:57 that they're finding. So the flip-of-a-coin analogy here was
02:13:00 not only totally inappropriate, but these are not independent
02:13:03 coin tosses. This is one coin toss based on one population.
02:13:07 Q. And then one more -- one more question. My friend on the
02:13:10 other side referred to the Charbotel study, and he said that
02:13:14 that study showed that, like, there's definitely kidney cancer
02:13:17 in TCE exposure. Is that the totality of what the Charbotel
02:13:21 said about kidney cancer risk and TCE exposure?
02:13:24 A. No. So, first of all, the Charbotel was limited to the
02:13:27 renal cell carcinoma, not the renal pelvis, urinary tract ones,
02:13:32 and they actually had multiple levels of exposure. And the
02:13:35 lower levels of exposure did not increase kidney cancer risk.
02:13:38 In that population, you had to be up to the 885 parts per
02:13:42 million, so more than a thousand-fold higher before they were
02:13:46 able to see a statistical increase.
02:13:48 MR. GUYNN: No further questions, Your Honor.
02:13:50 THE COURT: All right. Thank you. You're excused.
02:13:57 Thank you.
02:13:57 Call your next witness.
02:13:57 (The witness exits the witness stand at 2:14 p.m.)

02:13:57 MR. BAIN: Your Honor, I just want to inform you that
02:14:00 the rest of our witnesses are much shorter, and some are very
02:14:03 short, and our next witness is Dr. John Lipscomb.
02:14:06 THE COURT: Okay. Thank you.
02:14:07 THE CLERK: Place your left hand on the Bible, raise
02:14:07 your right hand, and state and spell your name for the record.
02:14:07 THE WITNESS: John Lipscomb, J-O-H-N L-I-P-S-C-O-M-B.

JOHN LIPSCOMB, PH.D., DABT,

02:14:20 was sworn at 2:14 p.m., and testified as follows:
02:14:48 THE COURT REPORTER: Ma'am, can I get your name?
02:14:48 MS. PLATT: Elizabeth Platt, P-L-A-T-T.
02:14:48 THE COURT REPORTER: Thank you.
02:14:48 THE COURT: You're Dr. Waddill?
02:14:48 THE WITNESS: I'm sorry? I'm John Lipscomb.
02:14:48 THE COURT: Lipscomb?
02:14:48 THE WITNESS: John Lipscomb, Your Honor.
02:14:48 THE COURT: Yeah, okay.
02:14:48 MS. PLATT: Good afternoon, Your Honor. Elizabeth
02:15:50 Platt for the United States. I have a witness binder and
02:15:56 copies of the demonstratives, if I may approach.
02:15:58 THE COURT: Yeah.
02:15:58 MS. PLATT: And for the record, I've marked the
02:16:40 demonstrative as Government Exhibit 2012.

DIRECT EXAMINATION BY MS. PLATT:

02:16:48 Q. Would you please state your name for the record?

02:16:50 A. John Lipscomb.
02:16:52 Q. And what is your occupation?
02:16:55 A. I'm a toxicologist and a risk assessor.
02:16:59 Q. And were you retained by the United States as an expert in this litigation?
02:17:01 A. Yes, I was.
02:17:02 Q. Dr. Lipscomb, would you please describe for the Court your educational background following high school?
02:17:04 A. I attended the University of Central Arkansas and gained a bachelor's degree in biology and a master's degree in biology, where I studied pharmacokinetics. I attended the University of Arkansas for Medical Sciences, and I obtained a Ph.D. degree in interdisciplinary toxicology in 1991.
02:17:07 Q. And, Dr. Lipscomb, where did you begin your career in toxicology?
02:17:11 A. In Jefferson, Arkansas, is where I began at the Food and Drug Administration's National Center for Toxicological Research in 1984.
02:17:14 Q. And where did you go after the FDA?
02:17:17 A. When I graduated with the Ph.D., I was commissioned an officer in the United States Air Force, and I was stationed at Wright-Patterson Air Force Base in Dayton, Ohio.
02:17:21 Q. And what was your role in the United States Air Force?
02:17:26 A. I was a research toxicologist, chief of the metabolism section. My role was to study the metabolism and contribute to
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02:18:13 pharmacokinetic understanding, knowing where it -- where a
02:18:16 chemical goes in the body for contaminants of interest to the
02:18:20 United States Air Force.
02:18:21 Q. And is there a specific chemical that you studied in the
02:18:24 Air Force?
02:18:26 A. Yes.
02:18:26 THE WITNESS: Your Honor, I spent most of my career
02:18:28 studying trichloroethylene, or TCE, and its metabolism in
02:18:31 humans.
02:18:33 Q. And after the Air Force, where did you go?
02:18:36 A. I sought and received a position at the U.S. Environmental
02:18:39 Protection Agency in Cincinnati, Ohio, in the division that ran
02:18:45 the Integrated Risk Information System, or the IRIS Information
02:18:49 System.
02:18:51 Q. And can you tell us a little bit more about your role at
02:18:54 the EPA?
02:18:56 A. Yes. A lot of my role at the EPA, beginning in 1998, was
02:19:03 related to trichloroethylene. I began work and contributing to
02:19:07 EPA's IRIS assessment for trichloroethylene, TCE. I also
02:19:11 worked on chemical mixtures. We had a strong component there
02:19:14 that was responsible for developing EPA guidance on chemical
02:19:18 mixtures, so I worked in that area as well.
02:19:21 Q. And, Dr. Lipscomb, you've mentioned these risk assessments
02:19:24 that you did for the EPA. What does EPA use those risk
02:19:27 assessments for?

02:19:30 A. EPA did those risk assessments on chemicals that were of
02:19:33 interest as environmental contaminants largely, and we did
02:19:36 those risk assessments so that they could be used as the basis
02:19:39 for federal law to help regulate the safety of environmental
02:19:44 exposures through air and through drinking water.
02:19:48 Q. And did you receive any awards while you were at the EPA?
02:19:52 A. I did, I received awards, cash awards, time-off awards,
02:19:57 accomplishments awards. I received six bronze medals, and I
02:20:01 received one gold medal, and the gold medal was for our work on
02:20:05 the trichloroethylene health risk assessment.
02:20:09 Q. And after your time in federal service, what did you do?
02:20:14 A. After I left federal service after a 35-year civilian and
02:20:17 military career, I took six months off to draw a deep breath,
02:20:21 reestablish my life. I moved back to Arkansas. I established
02:20:24 a small consulting company called Lipscomb & Associates, and I
02:20:28 went back to work part time with a company called CTEH, the
02:20:33 Center for Toxicology and Environmental Health, there in North
02:20:35 Little Rock.
02:20:37 Q. And, Dr. Lipscomb, throughout your career, have you had
02:20:40 the opportunity to publish any books, chapters or other
02:20:44 publications like peer-reviewed articles?
02:20:47 A. Yes, I have. I published -- they're in my CV and my
02:20:50 report. I published about 80 peer-reviewed manuscripts. I
02:20:54 published about 15 book chapters. I published about 40
02:20:59 government technical reports that were also peer reviewed and

02:21:03 contributed to other works as well.
02:21:05 Q. And were any of those publications related to the
02:21:08 chemicals at issue in this litigation?
02:21:12 A. Yes. I published quite a few articles on
02:21:14 trichloroethylene, or TCE, as well as some technical reports on
02:21:18 TCE.
02:21:19 Q. Have you had the opportunity to serve as a peer reviewer
02:21:22 or on editorial boards for journals?
02:21:26 A. Yes. I've been a peer reviewer for probably 30 years in
02:21:30 different -- different journals and different times.
02:21:33 Presently, I'm still a peer reviewer. I serve on an editorial
02:21:36 board for three different toxicology journals, and part of that
02:21:41 is a requirement to peer review the manuscripts that they send
02:21:44 me. It's not a volunteer job. Here's your paper; you review
02:21:47 it.
02:21:50 Q. And, Dr. Lipscomb, have you been a part of any
02:21:52 professional societies in your career?
02:21:55 A. Yes, I have. Formerly, I was a member of the American
02:21:59 Industrial Hygiene Association, which studies occupational
02:22:03 exposures, and a member of the International Society for Study
02:22:06 of Xenobiotics. Xenobiotic is any chemical foreign to the
02:22:10 body. That society studies drug-drug interactions -- how drugs
02:22:15 interact in the body, why you don't take two at once kind of
02:22:18 thing -- and chemical metabolism. Those two I dropped. I'm
02:22:21 still a member of the Society for Risk Analysis and the Society

of Toxicology.
Q. And at a high level, can you just tell us quickly what your involvement at the Society of Toxicology and the Society for Risk Analysis involves?
A. Okay. For both societies, here are the things that are the same: I'm a contributing member. I've been an officer and a past president of the geographic Ohio-based society chapter, and a president of the discipline-specific group, subgroup, subchapter or whatever. For the Society of Toxicology, I was president of the risk -- of the risk assessment specialty section. And for the Society for Risk Analysis, I was the president of the dose-response section, total crossover.
Q. Do you have any certifications?
A. I do.
THE WITNESS: Your Honor, I have two certifications in toxicology, one by the American Board of Toxicology and one by the -- excuse me -- the Academy of Toxicological Sciences.
Q. As part of your career, have you had the occasion to serve as an expert witness?
A. Not during my federal career. That was prohibited as well. Post -- post-federal career, yes.
Q. And have you ever served as an expert witness for the Department of Justice before?
A. No, I have not.
MS. PLATT: Your Honor, at this -- Your Honor, at

this time, I would like to tender Dr. Lipscomb as an expert in toxicology and regulatory risk standards.

THE COURT: He'll be accepted as an expert and allowed to express his opinions.

MS. PLATT: Thank you.

Q. Dr. Lipscomb, what is your role in this litigation?

A. My role was to develop materials that would help the Court understand what chemical regulations are, how they're based, what human health risk assessment is, as well as provide for an understanding of what chemical mixtures are and the nuances about how those chemicals in a mixture might work together to cause toxicity.

Q. And did you prepare a report in this litigation?

A. Yes, I did. I prepared an expert report and a supplemental expert report.

Q. Would you turn to the binder in front of you to the tab marked U.S. Exhibit 232? It should be the first tab in your binder.

A. Yes.

Q. Do you recognize what has been marked for identification as Exhibit 232?

A. Yes. This is my expert report in this matter.

Q. Did you write this report?

A. Yes, I did.

Q. Is it a true and accurate copy of this report?

02:25:08 A. It appears to be so.
02:25:09 MS. PLATT: Your Honor, I move for U.S. Exhibit 232 into evidence.
02:25:11 THE COURT: It's received.
02:25:12 (Defendant's Exhibit Number 232 received.)
02:25:12 Q. And would you turn to the next tab, which is labeled U.S. Exhibit 233? And do you recognize what has been marked for identification as U.S. Exhibit 233?
02:25:18 A. Yes, I do.
02:25:23 Q. And what is that?
02:25:25 A. This is the supplemental report from my work in this matter.
02:25:27 Q. And did you write this report?
02:25:28 A. Yes, I did.
02:25:33 Q. And is it a true and accurate copy of your report?
02:25:34 A. I believe so.
02:25:36 MS. PLATT: Your Honor, I move to admit U.S. Exhibit 233.
02:25:36 THE COURT: It's received.
02:25:39 (Defendant's Exhibit Number 233 received.)
02:25:40 Q. Could you describe your methods in this report?
02:25:42 A. Yes. My method is the same as I've used pretty much since the start of my career as a scientist. I want to first understand the question, see what this is about, what's the topic that I'm supposed to be interested in.
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02:26:05 Next, I want to understand the bounds of the literature,
02:26:09 the reports, et cetera, that are fair game for inclusion in
02:26:12 that. I want to focus on those one at a time. I want to read
02:26:17 that paper. I want to see if the data in that paper support
02:26:21 the conclusions made by the author. Sometimes they do -- well,
02:26:25 most times they do, but sometimes they don't. I want to make
02:26:28 sure for each of those papers that the paper I'm looking at is
02:26:33 accurate and reliable.
02:26:34 I want to do that for all the papers, and then I want to
02:26:38 look at the conclusions from all the papers together and see
02:26:42 what kind of conclusions I can draw from those and form those
02:26:46 conclusions into an opinion or a statement that is specific to
02:26:49 the purpose of that paper and answers the question that was
02:26:52 posed.
02:26:54 Q. And did you form any opinions in this litigation?
02:26:57 A. Yes, I did.
02:26:58 Q. And what are those opinions?
02:27:00 A. Well, they're contained in my expert report, but there are
02:27:03 three that are shown on this board over there and on the little
02:27:05 paper in front of you, Your Honor.
02:27:07 The first pertains to mixtures. The available evidence
02:27:12 that's been evaluated for the chemicals at Camp Lejeune do not
02:27:18 support a toxicologically synergistic interaction. That means
02:27:21 a greater than additive-type interaction. They don't do that.
02:27:24 The second opinion is that maximum contaminant levels or

regulatory values quantified by the EPA on the basis of oral reference dose values and that an exceedance of the MCL value doesn't mean risk.

Third, related to TSCA, the EPA's decision to ban TCE and to partially ban PCE is not based upon environmental contamination of the drinking water and is not related to the health risk from such contamination, but is from a conservative extrapolated risk from other uses that would result from significantly greater exposures.

Q. And, Dr. Lipscomb, before we get into the substance of those opinions, could you explain to us what toxicology is?

A. Toxicology is a mixture of disciplines. I said I have a degree in interdisciplinary toxicology. So toxicology as a whole is a mixture of chemistry, biology and medicine. It seeks to understand how a chemical moves through the body, what it might do, how it might do it, and the doses that may and the doses that may not produce those effects. It does this by understanding the biological systems that make up the body.

Q. And I think you used a new term we haven't heard yet, "biological systems." What is that?

A. Well, a biological system is an organization of components, whether they're at the cellular level or at the whole body, or the level where different organs act together in the same system. A biological system's components work together to maintain what we call homeostasis, or keep

02:29:02 everything going the way it should.
02:29:04 Q. And how do biological systems react to a chemical
02:29:08 exposure?
02:29:10 A. Well, I've got a graphic on that, but before we get to
02:29:15 that, how a biological -- how a biological system reacts to a
02:29:19 toxicant is a function of the biochemistry, the innate ability
02:29:24 of the chemical to interact with and hurt the system, as well
02:29:27 as the doses that are -- that the systems are exposed to. It's
02:29:31 not an automatic thing.
02:29:33 Q. And, Dr. Lipscomb, would you please briefly describe to us
02:29:36 what happens in a biological system based off of the slide
02:29:40 shown?
02:29:41 A. Yeah. Using this graphic, what we see on the top is what
02:29:44 might happen at the cellular level, and what we see at the
02:29:47 bottom might happen at the -- at the organism level.
02:29:50 So, first, a chemical in air, water is encountered by the
02:29:54 human who breathes the air, drinks the water, and that's the
02:29:57 exposure part of it. The chemical moves across a biological
02:30:01 membrane, gets into the blood and is distributed. The blood is
02:30:04 distributed to the tissues where the chemical can move from the
02:30:08 blood to the tissue to then become a tissue dose. That's where
02:30:11 a biological interaction can occur. That's the first point
02:30:15 where the chemical might interact with the cells, receptors or
02:30:19 proteins or structures.
02:30:21 That interaction may or may not produce what we call a

perturbation. The interaction has to be high enough and the dose high enough to produce an interaction big enough to produce that perturbation at the molecular biochemical level within the cell.

Q. And so do all exposures lead to adverse health effects?

A. No, they don't, and that's because that perturbation, that -- this graphic was taken from a National Academy of Sciences publication. That perturbation has to be high enough to first produce some early cellular changes in the cell. If those changes are of a magnitude, they can produce what's called an "adaptive response." That's where the cell acts like a thermostat on the wall. If it gets too hot, it kicks on, and it produces these adaptive changes that keep everything in line.

But if the perturbation is big enough and lasts long enough, the capacity of the cell to react to this and adapt is overcome, and then we see cell injury that can progress under sufficient dose -- doses to what we call the adverse health outcome.

Q. And so let's talk about your first opinion related to mixtures of chemicals like we see at Camp Lejeune. What is a mixture exposure?

THE WITNESS: A mixture, Your Honor, is an exposure whereby there are at least two chemicals that make up the exposure. Any great -- any exposure to chemicals more than one

02:31:49 is a mixtures exposure.
02:31:51 Q. And so what happens when an individual is exposed to
02:31:55 multiple chemicals?
02:31:57 A. What happens is a -- is determined by the molecular
02:32:01 biochemical attributes of the individual chemicals. So the
02:32:05 impact of the multiple chemicals on the mixture is determined
02:32:09 by those and can be studied using data on the chemicals
02:32:14 themselves.
02:32:15 Q. And I believe we have a slide on that, right,
02:32:17 Dr. Lipscomb?
02:32:18 A. We do.
02:32:25 Q. At a high level, can you explain what this slide is
02:32:28 showing?
02:32:30 A. I can.
02:32:30 THE WITNESS: Mixtures toxicology, Your Honor, is
02:32:33 like other stuff. It can be real technical and the verbiage
02:32:36 can be kind of difficult to get your hands around. But any
02:32:40 time there are two chemicals that -- that come together, the
02:32:43 first level is joint toxic action, and that's any response from
02:32:48 two chemicals.
02:32:48 Now, in mixtures toxicology, we break that down. The
02:32:54 response can either be result on simply adding the responses
02:32:57 from the individual chemicals together using a mathematical
02:33:00 equation where, like, one plus one equals two; or there can be
02:33:04 an interaction where additivity is not the case, where it's not

02:33:07 one plus one equals two, but it can be different. That has to
02:33:12 be studied. While it can be predicted, it's very difficult to
02:33:15 predict.
02:33:15 But that interaction can either increase the toxicity
02:33:18 of the mixture through something called synergy, or a greater
02:33:22 than additive response where two plus two equals six, or
02:33:28 antagonism, where the chemicals counteract one another to a
02:33:31 point, so two plus two equals three.
02:33:36 Q. And is it easy or difficult to predict what will happen
02:33:39 here with multiple chemical exposures?
02:33:42 A. It's recognized among mixtures toxicologists and by ATSDR
02:33:45 and others that predicting mixtures' interactions, the
02:33:49 antagonism or synergy are difficult.
02:33:52 Q. And does dose matter in that prediction?
02:33:55 A. Dose matters. What's been shown in the literature,
02:33:57 including out of the laboratory where I worked at
02:34:00 Wright-Patterson, was that the -- the interaction depends on
02:34:04 the doses. At low levels, interaction is not possible. You
02:34:08 stick with even the additive approach being recognized as
02:34:12 conservative, but that's -- that's what we -- that's what we do
02:34:15 in mixtures toxicology.
02:34:16 Q. And in relation to Camp Lejeune and the chemicals at Camp
02:34:20 Lejeune, what has ATSDR said about this mixtures exposure?
02:34:25 A. I've got another graphic on that, another slide, I
02:34:26 believe. These come from the ATSDR's documents. So the

02:34:40 additive approach, two plus two equals four, for both cancer
02:34:44 and hazard index provides a conservative or a health
02:34:47 protective -- we call it health protective because it may be an
02:34:50 overestimate and maybe not likely -- evaluation of exposure.
02:34:53 Hazard index is one of those additive approaches, and it is
02:35:01 generally recognized to be conservative or health protective in
02:35:05 estimating the responses from a chemical.
02:35:08 Third, ATSDR looked at data on two of the principal
02:35:12 contaminants, PCE and TCE. They reviewed the data. ATSDR
02:35:18 wrote, "There does not appear to be evidence of a synergist --
02:35:21 of synergistic effects greater than additive from PCE and TCE."
02:35:25 They went a little bit further, looking deeper into PCE
02:35:29 and TCE. ATSDR said, "Based on the mechanistic data for these
02:35:35 chemicals," they recommended a less than additive approach for
02:35:39 TCE and PCE cancer effects and non-cancer effects.
02:35:44 Q. Okay. Let's turn to the next topic of your final two
02:35:48 opinions about regulatory standards. Yesterday, the
02:35:51 plaintiff's experts mentioned the maximum contaminant level, or
02:35:54 MCL. What is that?
02:35:56 A. Well, I've got a graphic on that, too. It's pretty simple
02:35:59 and straightforward. MCL stands for maximum contaminant level,
02:36:03 and it's a level that's a regulatory value and an enforceable
02:36:07 standard.
02:36:12 Q. And under what statute are MCLs relevant?
02:36:17 A. MCLs are relevant under the Safe Drinking Water Act.

02:36:20 Q. And are the chemicals of concern here regulated under the
02:36:23 Safe Drinking Water Act through MCLs?
02:36:26 A. Yes. All of the chemicals at Camp Lejeune are regulated
02:36:29 under the Safe Drinking Water Act.
02:36:34 Q. And at a high level, how does EPA establish an MCL?
02:36:40 A. An MCL is established based on the oral reference dose
02:36:45 value, which is a -- is a value that's extrapolated on the
02:36:53 basis of toxicity doses that do and don't produce the effect,
02:36:58 but the no-effect dose is downwardly extrapolated tens of times
02:37:02 to produce a dose that doesn't produce the effect. This is the
02:37:06 reference dose. That reference dose is further divided by a
02:37:09 factor of five to come up with the MCL value.
02:37:13 Q. And does an MCL or an exceedance of an MCL represent a
02:37:18 health risk?
02:37:20 A. No. An exceedance of an MCL value cannot be interpreted
02:37:22 as if it's a health risk.
02:37:24 Q. So let's turn to your final opinion for today. Your final
02:37:28 opinion regards the ban on TCE and partial ban on PCE under
02:37:33 TSCA --
02:37:33 A. Yeah, I've got another graphic -- I've got another graphic
02:37:36 on that.
02:37:39 Q. What does TSCA stands for?
02:37:41 A. TSCA stands for the Toxic Substances Control Act. TSCA is
02:37:45 a different law than the Safe Drinking Water Act.
02:37:49 Q. And plaintiffs referenced this ban yesterday in their

02:37:53 opening statement. Can you briefly explain what TSCA
02:37:58 regulates?
02:37:59 A. TSCA regulates the exposures of workers and consumers that
02:38:03 may be exposed to chemicals in commerce.
02:38:08 Q. And what type of regulation applies under TSCA to TCE and
02:38:13 to PCE?
02:38:15 A. TSCA has proposed a complete ban of TCE and a partial ban
02:38:21 of PCE.
02:38:23 Q. Have those gone into effect?
02:38:26 A. No. EPA under TSCA is reconsidering both of those
02:38:29 regulations.
02:38:33 Q. How are the types of exposures looked at under TSCA
02:38:37 compared to the exposures at Camp Lejeune?
02:38:41 A. Well, there are two ways that I differentiate them. The
02:38:45 first is that the exposures under TSCA are under 54 conditions
02:38:52 of use for TCE. These are jobs like a brake cleaner in an
02:38:57 automotive shop, someone in a welding shop that's using TCE to
02:39:00 degrease components, metal parts so they can weld them
02:39:04 together; people working with spray adhesives where TCE is a
02:39:09 component there.
02:39:10 The exposures at Camp Lejeune are to TCE that occurs in
02:39:17 drinking water, but at much lower concentrations than in the
02:39:21 TSCA work.
02:39:25 Q. How do the durations of exposure differ under TSCA
02:39:29 compared to Camp Lejeune?

02:39:30 A. They differ substantially. TSCA evaluated the duration of
02:39:36 exposure of workers exposed for 31 or 40 years, whereas the
02:39:41 civilian workplace workforce at Camp Lejeune was estimated by
02:39:45 ATSDR to have a duration of 15 years. That's less than half of
02:39:50 the duration.
02:39:51 However, this was different for the Marines stationed at
02:39:55 Camp Lejeune because ATSDR showed that 85 percent of the
02:39:59 Marines were exposed for a duration even less than 3 years,
02:40:03 which is what ATSDR used to predict risk, and 50 percent of
02:40:09 those Marines were exposed for less than 18 months.
02:40:12 Q. So in conclusion, Dr. Lipscomb, what does the TSCA
02:40:17 regulations tell us about risk?
02:40:21 A. The TSCA regulations tell us that the risk under
02:40:27 occupational exposures were deemed to be unacceptable, but they
02:40:32 don't tell us anything at all about the risks of drinking
02:40:35 water.
02:40:35 Now, the reason they don't tell us anything at all about
02:40:39 drinking water are fundamentally that none of the conditions of
02:40:43 use that TSCA studied were drinking water. All of their TSCA
02:40:47 exposures were from occupational uses, or the use of commercial
02:40:51 products. The durations also differ a lot. TSCA makes it
02:40:56 clear that they don't do drinking water.
02:41:00 Q. Dr. Lipscomb, do you hold your opinions to a reasonable
02:41:01 degree of scientific certainty?
02:41:04 A. Yes, I do.

02:41:05 MS. PLATT: Your Honor, at this time, I move to admit
02:41:08 Exhibit 2 -- U.S. Exhibit 2012 into evidence.
02:41:16 THE COURT: Received.
02:41:16 (Defendant's Exhibit Number 2012 received.)
02:41:16 MS. PLATT: We pass the witness.
02:41:16 MR. SNIDOW: Cross, Your Honor?
02:41:16 THE COURT: Hmm?
02:41:21 MR. SNIDOW: Cross, Your Honor?
02:41:21 THE COURT: I can't hear you.
02:41:21 MR. SNIDOW: I'm sorry, Your Honor. May I
02:41:21 cross-examine the witness?
02:41:23 THE COURT: Yeah.
02:41:24 MR. SNIDOW: Thank you, Your Honor.
02:41:25 CROSS-EXAMINATION BY MR. SNIDOW:
02:41:25 Q. Good afternoon, Dr. Lipscomb.
02:41:27 A. Good afternoon.
02:41:28 Q. Dr. Lipscomb, you're aware one of the issues in this case
02:41:31 is whether the water at Camp Lejeune can cause kidney cancer,
02:41:35 aren't you?
02:41:35 A. Yes.
02:41:36 Q. And fair to say you're not providing an opinion on that
02:41:39 matter, are you?
02:41:42 A. Not directly, no.
02:41:43 Q. Not directly.
02:41:43 And you're aware one of the issues is, is whether

02:41:45 Mr. Mousser's kidney cancer was caused in any way by the water
02:41:49 at Camp Lejeune? You definitely have no opinion on that
02:41:51 matter, right?
02:41:52 A. That's correct.
02:41:53 Q. You didn't do any individualized risk assessment for
02:41:57 Mr. Mousser, true?
02:41:57 A. That's true.
02:41:58 Q. And, in fact, you don't think it's appropriate to do
02:42:01 individualized risk assessments, do you?
02:42:04 A. I wouldn't say that.
02:42:05 Q. Okay. Well, you've never seen it done before, have you?
02:42:08 A. I have -- not successfully, no, sir.
02:42:09 Q. Not successfully. Fair enough. Now, were you in the
02:42:14 courtroom when Dr. Shields testified a little bit ago?
02:42:17 A. Yes.
02:42:18 Q. Okay. Did you hear Dr. Shields say that he doesn't think
02:42:22 that TCE causes kidney cancer? Did you hear him say that?
02:42:26 A. There was a lot of back and forth. I wouldn't agree or
02:42:29 disagree with what you said, but there was --
02:42:31 Q. Fair enough. I just want this: You certainly agree that
02:42:35 TCE can cause kidney cancer, right?
02:42:36 A. Under some situations and some circumstances of exposure,
02:42:40 TCE can cause kidney cancer, and it's important to understand
02:42:45 the situations regarding exposure.
02:42:47 Q. Of course. And the reason for that is because you

02:42:50 actually worked on the EPA IRIS assessment, correct?
02:42:53 A. That's correct.
02:42:53 Q. And that was published in 2011, right?
02:42:55 A. Yes.
02:42:55 Q. And I don't have the whole thing printed out because it's
02:42:57 about like this, right? (Indicating.)
02:42:59 A. It's bigger than the IARC assessment, yes.
02:43:01 Q. Yes, indeed, it is. And you went through all the evidence
02:43:05 concerning TCE that you could find as of that time; is that
02:43:08 fair?
02:43:10 A. I was part of a team. The team went through some of that
02:43:12 stuff. Yes, we went through everything that we could find is a
02:43:17 generic, fair way to say that.
02:43:19 Q. And your ultimate conclusion in the IRIS project, am I
02:43:24 correct, is that TCE is characterized as carcinogenic to humans
02:43:29 by all routes of exposure? You guys concluded that, right?
02:43:33 A. I'm not looking at it. As best I can remember, that's
02:43:36 accurate. I would not disagree with that.
02:43:38 Q. Okay. Fair enough. And then you went on to say, "This
02:43:40 conclusion is based on convincing evidence of a causal
02:43:44 association between TCE exposure in humans and kidney cancer,"
02:43:48 right?
02:43:50 A. That's what it says, but the context would be around the
02:43:53 high-dose exposure that was recognized.
02:43:55 Q. Understood. Now, did you hear Dr. Shields say that all

02:44:01 the TCE goes to the liver and gets filtered out there,
02:44:04 something like that?
02:44:06 A. I've heard several inaccurate statements regarding the
02:44:09 pharmacokinetics of TCE --
02:44:10 Q. Yeah.
02:44:10 A. -- or other chemicals in the body. But you have to
02:44:13 recognize, I've been to college and grad school 11 years to
02:44:17 study pharmacokinetics, and I -- the nuances and wrinkles don't
02:44:21 escape me.
02:44:22 Q. But it sounds like you heard some inaccuracies in that
02:44:25 testimony; is that right?
02:44:27 A. Not only -- yeah, I've heard inaccuracies. There are
02:44:31 things I would have said other from both sides of the debate.
02:44:35 Q. Fair enough. Well, in that IRIS assessment, in fact, you
02:44:40 guys said, "The GSH conjugation pathway also begins
02:44:46 predominantly in the liver, but toxicologically significant
02:44:49 metabolic steps occur extrahepatically." That means outside
02:44:53 the liver, right?
02:44:54 A. It does.
02:44:55 Q. Yeah.
02:44:55 A. I spent about seven years of my graduate career studying
02:45:01 the glutathione transferase pathway, and I have a good
02:45:04 understanding of it.
02:45:04 Q. Okay.
02:45:04 A. There's more to what you said, but --

02:45:07 Q. Yeah. Well, and what you say here is, "Extrahepatically,
02:45:09 particularly in the kidney," right? That's what you wrote?
02:45:13 A. Yeah. There's metabolism in the kidney that bioactivates
02:45:16 one of the metabolites to become the causative agent that
02:45:19 produces -- it's recognized by many experts that that's what
02:45:24 happens --
02:45:24 Q. Yeah.
02:45:24 A. -- that the one metabolite is activated in the kidney, and
02:45:27 that's why you see the effect in the kidney.
02:45:30 Q. Yeah. So when Dr. Shields said all goes to the liver, you
02:45:33 disagree; absolutely goes to the kidney too, right? It's okay.
02:45:37 You can say it.
02:45:38 A. Do you want the full monty?
02:45:39 Q. Well, I --
02:45:39 A. I don't want to -- yeah, the blood flows through the body.
02:45:42 Blood goes to the liver. Blood goes to the heart. It goes to
02:45:45 the lungs. It goes to the kidney. Some of the chemical leaves
02:45:48 the blood in certain organs. Other part -- other chemicals,
02:45:52 other molecules of the chemical stay in the blood, but they
02:45:55 travel to another organ, so --
02:45:56 Q. And you go on to say --
02:45:56 A. -- you can't -- it doesn't go exclusively to any organ.
02:46:01 Q. You go on to say in the IRIS assessment, "This supports
02:46:04 the conclusion that these compounds are genotoxic, particularly
02:46:09 in the kidney," right?

02:46:12 A. I don't recall.
02:46:13 Q. But no reason to dispute that?
02:46:14 A. I would not argue with it.
02:46:17 Q. Fair. Now, Dr. Lipscomb, you talked about the EPA ban, right?
02:46:21 A. Okay.
02:46:23 Q. And you were saying that it was -- it was based largely on concerns about occupational exposure, right?
02:46:29 A. That's generally correct.
02:46:31 Q. All right. But you, in the IRIS assessment did, in fact, review the Charbotel study, right?
02:46:40 A. Yes.
02:46:41 Q. And you actually used the Charbotel study to construct the points of departure that you're talking about, right?
02:46:47 A. Yes. That's correct.
02:46:47 Q. Am I correct that to do that, you kind of have to make a dose-response curve; is that about right?
02:46:53 A. Dose response is a central tenet of toxicology.
02:46:56 Q. And if you remember right, there were kind of three results in the Charbotel study, right?
02:47:00 A. The Charbotel exposure was broken down into three different dose groups based on cumulative exposure, as I remember sitting here today.
02:47:09 Q. Yeah. And to make the dose-response curve, of course, you can't just use one result, can you? You need more than one

result, right?
A. Dose response is something that toxicologists go to school a long time to answer. And yes-or-no questions are hard. Your question covers both cancer and noncancer. We're talking about cancer here, so that's the way I'm going to answer your question.
Q. Fair enough. Let me ask you a different way, I think, maybe a little easier.
A. Thanks.
Q. When you guys were doing the IRIS assessment and looking at Charbotel, you never concluded, hey, what Charbotel really shows is that there's a threshold below the highest level of exposure, right?
A. I wouldn't say it like that. That's not the way it was discussed, and that's not the way it's done in cancer risk assessment. What we do is we pick the lowest dose that produces a statistically significant -- "actual" might be one word some people would use -- response.
Q. Yeah.
A. For chemicals that we, the EPA -- I'm speaking in the past, "we" -- when EPA assumes a chemical can interact with the DNA, the genes of the cell, they assume that no dose is without risk. And so, mathematically, what they do is they take that lowest dose and they draw a straight line down to the origin, to the 00. That's how it's done --

02:48:31 Q. Yeah.
02:48:31 A. -- in a nutshell.
02:48:32 Q. Fair enough. I just want to show you what the United
02:48:36 States Government said about the EPA ban, and we'll mark it as
02:48:43 Plaintiff's Exhibit 240.
02:48:46 Dr. Lipscomb, I'll represent to you this is a statement
02:48:58 that the U.S. EPA made when they were banning TCE.
02:49:04 A. Thanks.
02:49:04 Q. I just want to read a passage there. You see the middle
02:49:08 paragraph where it says, "TCE is an extremely toxic chemical"?
02:49:12 A. I didn't hear the first part of what you said, please.
02:49:15 Q. Fair enough. Do you see in the middle paragraph where it
02:49:16 says, "TCE is an extremely toxic chemical"?
02:49:19 A. I see that.
02:49:20 Q. And it goes on to say, "Known to cause liver cancer,
02:49:22 kidney cancer, and non-Hodgkin's lymphoma," right?
02:49:27 A. I do see that.
02:49:28 Q. Okay. And put aside the other cancers for another day.
02:49:30 You definitely agree TCE is known to cause kidney cancer, true?
02:49:34 A. Well, it's important to remember the source.
02:49:36 Q. Yeah.
02:49:36 A. And what I'm looking at is a copy of a press release,
02:49:40 which is not a scientific article. It's not been through peer
02:49:43 review. There's no evidence that a scientist had anything to
02:49:46 do with this. And it's not a statement or a document that a

reliable scientist would rely upon in forming some opinions, but that's what it says.

Q. Well, actually, you agree that TCE is a known kidney carcinogen, right?

A. We have to go back. I don't want to be argumentative.

Q. Okay. No worries.

A. We have to go back to the dosage.

THE COURT: You don't want to be argumentative?

Q. Fair enough.

THE WITNESS: I'm doing my best.

Q. And, Dr. Lipscomb, I'm about to let you go. I just want to read one more sentence into the record. You see where it says there, "These risks are present even at very small concentrations"? Do you see that language?

A. Where is that language, please?

Q. Right after it talks about TCE causing those various things, it says, "These risks are present even at very small concentrations," right?

A. I'll trust you on that. I'm having trouble finding it.

Q. It's all right. Right here it says --

A. Oh.

Q. -- "These risks are present even at very small concentrations." Is that --

A. I heard TCE and not PCE.

Q. Oh, fair enough.

A. Yes.
Q. Okay.
MR. SNIDOW: No further questions, Your Honor.
THE COURT: Do you have any questions?
MS. PLATT: No cross-exam [sic], Your Honor.
THE COURT: Be excused.
THE WITNESS: Thank you.
(The witness exits the witness stand at 2:50 p.m.)
THE COURT: You got any other witnesses?
MR. BAIN: Your Honor, the United States calls Dr. Judy LaKind.
THE CLERK: Place your left hand on the Bible, raise your right hand, and state and spell your name for the record.
THE WITNESS: Judy Sue LaKind, J-U-D-Y S-U-E L-A-K-I-N-D.

JUDY LAKIND, PH.D.,

was sworn at 2:51 p.m., and testified as follows:

MR. ANTONUCCI: Your Honor, Giovanni Antonucci for the United States. Before I begin, I have copies of the demonstrative, should the Court wish to receive them and should I be allowed to provide one to the witness.
THE COURT: I can't hear you.
MR. ANTONUCCI: Your Honor, may I provide a copy of the demonstrative to yourself and to the witness?
THE COURT: To the witness?

02:52:52 MR. ANTONUCCI: Yes, sir.
02:52:52 THE COURT: Yeah.
02:52:55 MR. ANTONUCCI: Thank you.
02:52:56 Dr. LaKind, are you ready to begin?
02:53:30 THE WITNESS: I am.
02:53:32 DIRECT EXAMINATION BY MR. ANTONUCCI:
02:53:32 Q. Good afternoon. Please state your name for the record.
02:53:35 A. Judy Sue LaKind.
02:53:39 Q. Have you been retained by the Department of Justice to offer expert opinions in this case?
02:53:42 A. I have.
02:53:44 Q. Are you offering expert opinions concerning Mr. Mousser's exposure to contaminants in this case?
02:53:50 A. Yes, I am.
02:53:52 Q. We'll talk about those opinions in just a few minutes, but first, I'd like to talk about your qualifications to testify as an expert. What is your occupation?
02:53:58 A. I'm an exposure scientist.
02:54:01 Q. What is exposure science?
02:54:03 A. Yes, so in exposure science, we study the way humans interact with various stressors, including chemicals, and we tend to focus on major routes of exposure; for example, inhaling a chemical or ingesting it or touching it with skin contact.
02:54:05 Q. For how long have you worked as an exposure scientist?
02:54:08
02:54:11
02:54:15
02:54:19
02:54:20

A. About 38 years.
Q. Can you please describe for the Court your educational background after high school?
A. I can. So my bachelor's degree was from the Johns Hopkins University in earth and planetary sciences. I received my master's degree from the University of Wisconsin in Madison in geology, and then I received my Ph.D. from Johns Hopkins in geography and environmental engineering.
Q. Dr. LaKind, do you currently hold any academic appointments?
A. I do. I have two. I'm an adjunct associate professor at the University of Maryland School of Medicine, and that's in the Department of Epidemiology and Public Health. And I'm also a Whiting Fellow with the Department of Applied Mathematics and Statistics at the Johns Hopkins University.
THE COURT: Are you going to object to her being a witness -- an expert witness?
MR. QUINN: No. No, sir.
THE COURT: Do you want to skip this? She's got a record of it.
MR. ANTONUCCI: Your Honor, at this time, United States moves to proffer Dr. LaKind as a qualified expert witness in the field of exposure science.
THE COURT: Allowed. She can express her opinions.
Q. Dr. LaKind, what were you asked to do in this case?

02:55:25 A. Yes, I was asked to assess exposure to plaintiffs at Camp
02:55:28 Lejeune, and the exposure being the chemicals of concern in the
02:55:32 water at Camp Lejeune.
02:55:34 Q. Have you created a presentation to help illustrate your
02:55:37 opinions?
02:55:37 A. Yes, I have.
02:55:38 Q. And is that being shown to the Court now?
02:55:40 A. Yes, it is.
02:55:41 Q. Dr. LaKind, what were your goals in setting out to
02:55:45 describe Mr. Mousser's exposure?
02:55:46 A. Yes, if you can go to the next slide. But very simply
02:55:49 put, my goals were to develop exposure estimates that were
02:55:53 scientifically defensible, that were realistic, but also that
02:55:57 were conservative. And by conservative, I mean they would be
02:56:00 at the high end of exposure in order to avoid underestimating
02:56:04 exposure.
02:56:06 Q. So I'd like to ask you now about how you did this. What
02:56:08 sorts of things do you take into account when assessing a
02:56:11 person's exposure to a contaminant?
02:56:13 A. Yes, so on the next slide, so very big picture -- we take
02:56:17 into account lots of things, but very big picture, exposure
02:56:21 scientists look at the amount of the exposure, the route of the
02:56:23 exposure, and we look at human behaviors and characteristics.
02:56:27 Q. So, Dr. LaKind, let's take those one at a time. Starting
02:56:30 with amount of exposure, can you please explain what that is?

02:56:34 A. Yeah, so on the next slide, when we talk about amount of
02:56:37 exposure, very simply put, we're just talking about dose. And
02:56:40 I think you've heard these units before in this case, but we
02:56:44 often talk about dose and units of microgram of a chemical per
02:56:48 kilogram body weight per day. And I'd like to just mention why
02:56:52 dose is so important, and I'm going to use an example with
02:56:54 alcohol, but I want to be really clear that I'm just using an
02:56:58 example that we all kind of as laypeople understand. I'm not
02:57:01 in any way equating exposure to alcohol with exposure to
02:57:04 chemicals at Camp Lejeune.
02:57:06 But in terms of why dose matters, we can imagine a
02:57:09 situation where we have a person who drinks one drink per week,
02:57:12 and then we have another person who drinks several drinks every
02:57:15 day, and I think we can just intuitively understand that those
02:57:19 two people are very likely to have different outcomes. So the
02:57:22 amount or the dose matters.
02:57:26 Q. Dr. LaKind, have you created a slide illustrating the
02:57:29 units of dose?
02:57:30 A. I have. That's on the next slide. So, again, very --
02:57:34 Q. Can you please explain this?
02:57:35 A. Oh, I'm sorry. Very simply put, I think I mentioned
02:57:38 already microgram per kilogram day. We're talking about the
02:57:42 mass of the chemical, micrograms, per kilogram of a person's
02:57:46 body weight per day. And it's just shown -- I wrote it on the
02:57:49 bottom of this graphic just so you can kind of visualize what

I'm saying when I say "microgram per kilogram day." That's what it looks like.
Q. So what happens to the dose, all else being equal, when a person's body weight changes?
A. Yeah, so, for example, if a person's body weight increases, then all else being equal, arithmetically, the dose would decrease.
Q. Before we get further into the weeds, I'd like to ask you a bit more about the units of your results. Can you please explain for the Court what a microgram is?
A. Yeah, so on the next slide, I'm going to, again, use one of these examples that just as a lay -- we all understand it, just as laypeople. A microgram is a unit of mass. It equals a millionth of a gram, and for most of us, that's pretty hard to visualize, but a single grain of salt equals about 50 to 100 micrograms. We can kind of get a visual image of what a microgram looks like.
Q. And before we move on, Dr. LaKind, because we don't often measure volume in terms of liters here in the United States, I'm holding up a 32-ounce water bottle. Approximately how much water does this water bottle hold?
A. It's approximately a liter.
Q. So, Dr. LaKind, returning to the things that you take into account when assessing a person's exposure, what are the routes of exposure that you considered for people exposed to the water

at Camp Lejeune?
A. Right. That's on the next slide. And I think so far mostly in this case, we've heard a lot about drinking water, but I considered three main routes of exposure. I considered dermal exposure, so how the chemical crosses the skin and gets into the body. I also included ingestion exposure. That's like the drinking water route where we take it in the mouth and we swallow it. But I also included inhalation, or how much we breathe in.

And that might not be particularly obvious because, you know, the chemicals are in the water, so why do we care about inhalation? But I think we've heard numerous times that these chemicals are volatile. They tend to move into the air, and that makes them available for people to breathe in, and so I also examined the inhalation route of exposure.

Q. Dr. LaKind, what are the sources of exposure information for exposure scientists who are conducting an exposure assessment?

A. Yeah, there are lots of sources of information, but if you go to the next slide, I'll just show you a few of the main ones that I used in my exposure assessments.

So the first is self-reports of personal information, and here I'm talking about things that we're all familiar with, like diaries or questionnaires. For Camp Lejeune, we happened to have depositions, and that was a source of personal

03:00:16 information. Unfortunately, that doesn't give us all the
03:00:19 information that we need, but it is the case that there have
03:00:22 been lots and lots of studies out there on people's behavior
03:00:26 and their characteristics.
03:00:27 And the U.S. EPA has taken lots of these studies, and
03:00:31 they've aggregated them and they've evaluated them and they've
03:00:34 summarized them in a book that they call the *Exposure Factors*
03:00:37 *Handbook*. It was first published in 2011, and it's a really
03:00:40 key source of exposure information for really everybody in my
03:00:44 field. And then, of course, we also have measurements and
03:00:47 models that we can use as sources of information.
03:00:51 Q. So starting here with the self-reports of personal
03:00:55 information, you mentioned depositions in this case. Were
03:00:58 there any other sources that you used to evaluate individuals'
03:01:04 behavior or characteristics.
03:01:06 A. Yeah, so I had their military documents available to me.
03:01:08 I had housing records. I had deployment records. And I used
03:01:12 all of that information.
03:01:13 Q. How did you use that information in your exposure
03:01:16 assessment?
03:01:17 A. Well, they were sources of information for things like
03:01:20 when the plaintiff was on base, when they had to leave for
03:01:24 deployment. In their depositions, they often talked about
03:01:27 things like how much water they drank or how often they
03:01:29 showered, how long they showered for, and all that information

could be used in the exposure assessment.
Q. Did you make any assumptions about a person's duration of exposure to water at Camp Lejeune?
A. I did. So I assumed that if a person was on base for at least two days out of any month, that they were on base for the whole month and could have been exposed over the whole month.
Q. Did you have any measurements to use in performing this analysis?
A. Right. So I think here we're talking about measurements of chemicals in the water, and there were very few measurements done at Camp Lejeune. And to my knowledge, they were done mostly after 1980, and so I really didn't have enough measurement data to use for my exposure assessments.
Q. So what did you use in place of measurements?
A. Right. I used the ATSDR modeled monthly water concentration data that we've been hearing about.
Q. So could you please explain, why did you use the simulated contaminant concentrations that ATSDR produced?
A. Yes, there were -- there were a few reasons. The first is that the Department of Justice asked me to use that information because they wanted me to be able to answer the question, if the chemicals in the water at Camp Lejeune were what ATSDR modeled, then what would exposure look like? And so I was able to use that information to answer that question.
The second is I wanted to be able to provide a

03:02:48 quantitative estimate of exposure. All I mean is I didn't want
03:02:50 to just say low, medium, high. I wanted actual numbers. And
03:02:53 to do that, you need chemical concentration data, and to my
03:02:57 knowledge, the ATSDR model data is the only data set available
03:03:01 to do that, and it's the only comprehensive data set. And by
03:03:05 comprehensive, all I mean is it covered the entire time span
03:03:07 that the plaintiffs could have been on base.
03:03:09 The other thing was that the Department of Justice water
03:03:14 modelers, in their expert reports, they indicated that the
03:03:17 ATSDR data were conservative. In other words, they were biased
03:03:20 high. And for exposure assessment, that's actually fit for
03:03:24 purpose. We are okay with using information that's
03:03:28 conservative, that's biased high, because what we don't want to
03:03:30 do is underestimate exposure.
03:03:33 Q. So, Dr. LaKind, you've alluded to this. Are you aware of
03:03:36 the reports of Dr. Spiliotopoulos and Dr. Hennet, the United
03:03:39 States' water modeling experts in this case?
03:03:41 A. I am.
03:03:42 Q. Do you have any opinions of your own on the validity of
03:03:46 ATSDR's modeled contaminant concentrations?
03:03:48 A. No, I don't.
03:03:49 Q. So, Dr. LaKind, to be clear on this, if you understand
03:03:53 ATSDR's estimates may be overestimates, why did you use them in
03:03:57 your analysis anyways?
03:03:59 A. Right. As I mentioned, you know, we don't want to

underestimate exposure. We're okay with using conservative or biased-high information because that information is going to be used for things like a risk assessment, and we don't want to underestimate risk. So if we're biased high, we're okay with that because it's protective of public health.

Q. Dr. LaKind, you previously mentioned exposure assessors use models. Can we be sure that models are a perfect representation of the real world?

A. No, we can't. And, in fact, they are not -- they are not a perfect representation of the real world.

Q. Why is that?

A. Because the world is full of variability. It's full of uncertainty.

Q. How did you address that here?

A. Yeah, so in my reports, in order to address variability and uncertainty, I -- you know, there are a few ways to do this. I mean, you can look at it, like, as an individual or you can think about it as a population. Let me give you a quick example using a population, and I'll use drinking water as the example. So what I did --

THE COURT: Can you hear her okay? Do you have any problem?

MR. QUINN: I can hear, yes, sir.

THE COURT: Okay.

THE WITNESS: Your Honor, can you hear me? I can be

louder.

THE COURT: What's that?

THE WITNESS: Can you hear me? Because I can be louder.

THE COURT: Obviously, I'm having a problem hearing you. Your voice is very slow and low.

THE WITNESS: I will speak up.

THE COURT: Thank you.

THE WITNESS: Okay.

A. So I used a population basis for my assessment at Camp Lejeune, and all I mean by that is because we can never know exactly how much Mr. Mousser drank at Camp Lejeune every day, we can't know that for ourselves.

So what we do instead is we say, okay, let's picture a group of people at Camp Lejeune, and let's assume that some part of that group drinks a typical amount of water that people in the country drink every day. It's a little over a liter a day. We call it a central tendency or average amount.

And then we can assume there's a part of the population that drinks a lot more water. They drink, like, three liters of water a day, and that's called the reasonable maximum amount. It's the 95th percentile of the U.S. population drinks that much water.

And then I also imagine that part of that population drinks even more water because the ATSDR tells us that Marines

in training at their high end of water consumption can drink about six liters of water a day.

And so I do exposure estimates for each of those three groups, and I get a range of exposure estimates, including this very high end. And by doing that, I can be pretty confident that I'm including Mr. Mousser's exposures, water intakes and exposures, and that I'm not underestimating his exposure.

Q. So, Dr. LaKind, can you state with certainty the exact amount of exposure that was experienced by Mr. Mousser at Camp Lejeune?

A. No. I don't think anyone can do that.

Q. Is it your opinion that the high end of the exposure range that you provided is the actual amount that Mr. Mousser was exposed to?

A. No, not at all. It's an estimate based on interviews with various people by ATSDR and other documents as well.

Q. Why is it that when you conduct an exposure assessment, you seek to avoid underestimating exposure?

A. As I said before, we want to be protective of public health. We want to make sure that we're not underestimating risk.

Q. So, Dr. LaKind, was your goal to determine Mr. Mousser's exact exposure accurately?

A. No. It was to develop a range of exposures that would include his exposure.

03:07:20 Q. Dr. LaKind, when you provide your exposure assessment
03:07:24 results for these plaintiffs, are you, in fact, presenting
03:07:26 exposure assessment results for a population similarly situated
03:07:31 to a given individual?
03:07:33 A. Yes, and I should have mentioned that. This population
03:07:35 that I'm envisioning would be very much like Mr. Mousser in all
03:07:38 the ways that we know about Mr. Mousser, so the dates he was on
03:07:41 base, where he lived and worked, and the kind of activities
03:07:44 that he undertook. This population would be just like that.
03:07:47 Q. So I'd like to take a step back and get a big-picture
03:07:50 look. What are the steps that you took to actually estimate
03:07:55 Mr. Mousser's exposures?
03:07:56 A. Yeah, I have a slide on that, and it's got a lot of text,
03:07:59 but I'm just going to walk you through it really quickly.
03:08:01 Basically, I already mentioned that I got a lot of information
03:08:03 on Mr. Mousser from his depositions and other military
03:08:07 documents.
03:08:07 I had the ATSDR water concentration data, and I used all
03:08:11 that information in three models. I had ATSDR's, what they
03:08:15 call their shower model. That allows me to estimate dermal and
03:08:19 inhalation exposure. And then I had the ATSDR, what they call
03:08:23 their public health assessment tool. I used that to estimate
03:08:27 ingestion exposure. And then ATSDR also provided a -- in one
03:08:31 of their public health documents, a model that one could use to
03:08:34 estimate concentrations in the mess hall.

03:08:38 Q. Dr. LaKind, are all of the methods that you described
03:08:40 well-accepted in the field of exposure science?
03:08:43 A. Yeah, they were all developed by federal agencies, and
03:08:46 they've been used -- the underlying equations have been in use
03:08:49 for decades.
03:08:50 Q. So I'd like to talk to you about Mr. Mousser's exposures,
03:08:55 and we heard a lot about Mr. Mousser's information related to
03:08:58 his exposure to water at Camp Lejeune. Is there anything in
03:09:02 particular you think is important to share with the Court?
03:09:04 A. Yeah, so if you go to the next slide, and, again, I'm not
03:09:06 going to read all this. It's just really there for the record.
03:09:08 But -- and we heard a lot of this over the last day or so, but
03:09:13 a couple of things we know from Mr. Mousser's testimony is that
03:09:17 he took one to two showers a day, he drank somewhere in the
03:09:21 neighborhood of two and a half liters of water per day, and he
03:09:25 was, I guess, required -- I'm not sure what the right word is,
03:09:29 but he had mess hall duty on two separate occasions.
03:09:33 Q. Dr. LaKind, did you make any conservative assumptions
03:09:36 specific to Mr. Mousser's exposure?
03:09:38 A. I did. There were conservative assumptions built into the
03:09:42 assessment, but I'll show you two on the next couple of slides.
03:09:44 So, first of all, regarding water intake, as I just
03:09:48 mentioned, Mr. Mousser recalled drinking somewhere in the
03:09:51 neighborhood of two and a half liters per day. That's not an
03:09:53 exact number. It's an estimate based on his recollection. But

I also estimated his exposure using that number that I talked about before, the reasonable maximum intake of a little over three liters a day, and I used the Marine-in-training high-end value of six liters a day.

Q. Did you make any other conservative assumptions specific to Mr. Mousser's exposure?

A. I did. That's on the next slide. So as I just mentioned, Mr. Mousser recalled heavy mess hall duty and he recalled having that duty twice, but I couldn't find any information on when he had mess hall duty.

And the water concentrations provided by ATSDR vary from month to month, and so what I did was I used the month that had among the highest concentrations for the chemicals over the entire time that he was on base in order to estimate mess hall air concentrations.

Q. Dr. LaKind, let's talk about your results. What were the results of your assessment for Mr. Mousser?

A. Right. So on the next slide, so, again, I'm not going to read the numbers on this slide. These are all in my report. This is simply to show you that -- and this is just TCE. But for all four chemicals, my reports had quantitative estimates of Mr. Mousser's exposure for the dermal ingestion and inhalation pathway, all in units of dose, the kind of units I mentioned before, microgram of the chemical per kilogram day.

For anything related to inhalation, I also included the

results in the units of microgram of the chemical per cubic meter of air, and I did that because that's part of the standard EPA risk assessment approach. This is how you present the exposure units for doing an inhalation risk assessment.

Q. Dr. LaKind, did you describe in detail your entire evaluation for Mr. Mousser in your report?

A. I did.

Q. Did your report contain all of your results for Mr. Mousser's exposure assessment?

A. It does.

MR. ANTONUCCI: Permission to approach the witness, Your Honor.

THE COURT: Yeah.

Q. Dr. LaKind, I've handed you what's been marked for identification as United States Exhibit 950. Do you recognize Exhibit 950?

A. I do.

Q. What is Exhibit 950?

A. So this is my main report, my CV, and then supplemental reports.

Q. Did you write this report?

A. I did.

Q. Is this a true and accurate copy of your report?

A. I believe it is, just from flipping through it.

MR. ANTONUCCI: Your Honor, the United States moves

to admit Exhibit 950 into evidence.

THE COURT: Received.

(Defendant's Exhibit Number 950 received.)

Q. Dr. LaKind, what did you do with the results of your analysis?

A. So I provided my results to Dr. Bailey at Gradient so that she could use them in her assessment of health risk.

Q. What are your takeaways from Mr. Mousser's exposure?

A. Yeah, those are on the next slide. Again, very big picture, what I found in looking at Mr. Mousser's exposures was that there were very wide variations in his exposure that depended on the source of water he was exposed to, so either Hadnot Point or Tarawa Terrace; his activities; and also the specific chemical of interest.

Q. You mentioned that Mr. Mousser's exposures varied by chemical of interest. What did you mean by that?

A. Yeah, I have one example on the next slide. And let me just get you oriented because it's a graphic, and sometimes these are hard to read. But along the Y, or that vertical up-and-down axis, that's dose, and we've talked about dose already. That's microgram of the chemical per kilogram per day.

And each color of the bar represents a different chemical. And this is for his ingestion exposure at that very high-end rate of six liters a day. And what you can see is that,

03:13:50 depending on the chemical, his exposure would be different from
03:13:54 chemical to chemical.
03:13:58 Q. So, Dr. LaKind, I'd like to talk to you now about the
03:14:01 plaintiff's exposure assessment expert, Dr. Kelly Reynolds.
03:14:04 Have you read Dr. Reynolds's reports in this case?
03:14:08 A. I have.
03:14:08 Q. Have you read Dr. Reynolds's deposition transcripts in
03:14:11 this case?
03:14:12 A. Yes, I have.
03:14:13 Q. And were you present in the courtroom for Dr. Reynolds's
03:14:16 deposition -- for Dr. Reynolds's trial testimony in this case?
03:14:19 A. Yes, I was.
03:14:21 Q. Did you hear me ask Dr. Reynolds questions about her
03:14:24 computation of Mr. Mousser's exposure in microgram per liter
03:14:27 months?
03:14:28 A. I did.
03:14:29 Q. Did you hear Dr. Reynolds's explanation of how she
03:14:32 performed the calculation of microgram per liter months?
03:14:35 A. I did.
03:14:36 Q. What did you think of her explanation?
03:14:39 A. I think it was incorrect.
03:14:43 Q. Why is that?
03:14:45 A. So as simply as I can explain this because it's hard to
03:14:47 talk about units, but when we talk about microgram per liter
03:14:52 times month, we're talking about a concentration times an

amount of time. And I think what Dr. Reynolds said was -- well, let me -- let me not say what Dr. Reynolds said because I don't want to pretend that I've memorized it. Can I give you an example?

Q. Please. Provide an example of what you thought of her explanation.

A. Okay. So I believe what she said was that -- and this is a hypothetical example, but let's just pretend that the water concentration of the chemical is two microgram per liter, and somebody was on base for a month, then the total exposure would be two microgram per liter month, because we just multiply them.

But if someone was on base for only half a month, Dr. Reynolds, if I heard her correctly, stated that it would still be two microgram per liter times the month, whereas, in fact, it should have been times half a month, and so the exposure should have been half as much.

Q. Okay. What was the impact of Dr. Reynolds not accounting for partial months?

A. I believe she would have overestimated exposure, at least in those units.

Q. Let's talk about your primary exposure assessments. Starting with areas of agreement, what, if anything, did you and Dr. Reynolds both do?

A. Yeah, that's in the next slide. We did some things the

same way, and we used the same ATSDR mean modeled monthly data. And I won't read all of this, but just as another example, we both relied on plaintiff documents to understand when Mr. Mousser would have been on base. The only difference there being that she broke things out by days, and I broke things out by one month at a time.

Q. Are your results similar to Dr. Reynolds's results?

A. Yeah, so here's where it gets a little bit tricky, but let me show you on the next slide because the answer is sort of yes and no, and I'll explain -- I'll explain why.

But let me first get you oriented to this table. The left-hand column are the chemicals that we've been talking about. The next column are Dr. Reynolds's results in terms of total mass. She talked about that in terms of micrograms. And then the next column over are my results in terms of dose, microgram per kilogram day.

And if you compare her numbers to my numbers, you can see they're really different. And so that's the yes part of the answer. We're very -- our look -- our results look very different. But that's really driven by the fact that we used different units.

So you could actually take Dr. Reynolds's results in micrograms and you could convert her results to units of microgram per kilogram day. And all you have to do is divide by the number of days that Dr. Reynolds assumed Mr. Mousser was

on base, 891 days, and then divide by the body weight of an adult, and that puts us in the same units.

So if you flip the next slide, you can see now what our results look like next to each other. So, once again, I'll just get you focused. That Y axis or vertical axis, again, is dose except now what we're talking about, we're both using microgram/kilogram/day, and each color represents a different chemical. And Dr. Reynolds's results are the left bar, and mine are the right. So they're not exactly the same, and you wouldn't expect them to be because we use different assumptions, but at least now you see that our results are in the same ballpark.

Q. And for the record, for this chart, are you referring to all routes of exposure or just one?

A. This is just water ingestion. I can't compare our results in any other route because Dr. Reynolds did not look at dermal and inhalation exposure.

Q. Did you do anything differently from Dr. Reynolds?

A. Yeah, so some examples are on the next slide. I'm just going to really talk about two differences, and I've mentioned this before. We both looked at water consumption, but I also looked at inhalation in communal facilities -- I'm talking about barracks bathrooms here -- and dermal contact in communal facilities, so showers, toilets, sinks; and also inhalation in the mess hall, and Dr. Reynolds did not look at those sources

or routes.
Q. What is the significance of that?
A. Well, as I mentioned before, we know these chemicals are volatile. We know there's going to be the possibility of inhalation of these chemicals. And we know people are touching the water, and there's the likelihood of dermal exposure. So I think, ultimately, my exposure assessment was more complete and more realistic and probably more conservative than it would have been had I only looked at drinking water.
Q. Did you do anything else differently from Dr. Reynolds?
A. Yes. I've just one more example on the next slide. And I've already mentioned that we use different units. Dr. Reynolds focused on micrograms, and I focused on what I think of as standard dose units of microgram per kilogram day.
And let me just quickly tell you why I think this is so important. The units that I use account for time and they account for body weight. Quick example on why time matters. So I used an example of alcohol earlier, so let me use alcohol again.
So picture a table, and it's got 50 martini glasses on it and they each have a martini in them. You could go ahead and measure the mass of the alcohol in all 50 glasses and sum it up and get a total mass of alcohol. There's nothing wrong with doing that. It's just a total mass of alcohol. But it doesn't tell you what you need to know in terms of health.

So now imagine a different scenario. Same table, same 50 martinis. But you have one person who drinks all 50 martinis, but only one per year; and you have another person who drinks all 50 martinis in one day. And I think we kind of, again, inherently understand that there's likely to be a very different health outcome. So the amount of time over which we consume that amount of alcohol is really important.

And then the other issue I raised there is that the units that I use account for body weight, and if I could just show you why on the next slide. This looks like a really busy graph, but it's not too bad. I'm going to just walk you through it.

This is a blood alcohol content graph, and just focus on those two white ovals that I've put on the graphic. That left oval, what that shows is that if you're a person who weighs somewhere between around 100 and 140 pounds and you drink two drinks in an hour, you would be considered legally intoxicated. That's what the red shows.

Now picture a much heavier person. They weigh somewhere between around 160 to 200 pounds. They drink the same two drinks; they would only be considered impaired. So if we didn't consider body weight, we wouldn't understand these differences in outcome.

Q. Prior to reading Dr. Reynolds's report, had you ever in your career seen total micrograms mass used as the units in an

exposure assessment?
A. No, I hadn't.
Q. Dr. LaKind, you mentioned that Dr. Reynolds's numbers appear to be much larger than yours. Why is that?
A. Yeah, I have just one simple slide on this. And, again, let me just use a very simple example that we all tend to have a familiarity with. That's the only reason I'm using this.

Picture a peanut, right? If you have a peanut in your hand, you kind of know what it feels like. A peanut weighs about a gram, which is the same as 1,000 milligrams. So now imagine a situation, you've got a person; they're going to eat one peanut a day for 1,000 days, and they're an adult, so they weigh about 80 kilograms.

Now, in my approach to assessing exposure, I'm going to use dose in milligram/kilogram/day. So I'm going to take the 1,000 milligram per day. That's the one peanut a day. I'm going to adjust for body weight. And my picture of exposure would be 12 and a half milligram per kilogram day.

For Dr. Reynolds's approach, what I assume she would do, is take 1,000 milligrams per day, one peanut a day, multiply by 1,000 days, and her result would be a thousand -- excuse me -- a million milligrams of peanut. It's the same scenario. It's one person eating a peanut once a day for a thousand days. It's the same exposure. But the way that you express it, the way you describe it with these units, it can look dramatically

different when it's really not.
Q. What are your conclusions from your analysis?
A. Yeah, those are on the last slide. So I used standard well-accepted exposure models. I used conservative assumptions that are unlikely to underestimate Mr. Mousser's exposure. I evaluated all major routes of exposure. I used standard units to express exposure estimates for Mr. Mousser, and I believe that my exposure estimate is unlikely to underestimate Mr. Mousser's exposure.
Q. Do you hold all of the opinions you've expressed today to a reasonable degree of scientific certainty?
A. I do.
MR. ANTONUCCI: Your Honor, the United States moves that the illustrative exhibit be identified as Exhibit 213 and admitted into evidence for illustrative purposes.
THE COURT: It'll be admitted.
(Defendant's Exhibit Number 213 received.)
MR. ANTONUCCI: Thank you, Dr. LaKind. No further questions.
THE COURT: Do you have any questions?
MR. QUINN: Yes, sir.
CROSS-EXAMINATION BY MR. QUINN:
Q. Dr. LaKind, you've been paid a lot of money for your work as an expert in this case, haven't you, ma'am?
A. So I don't know how to compare, for example, what I've

03:23:47 been paid compared to what lawyers bill, but I think that my
03:23:50 hourly rate is similar to what I've seen other experts bill.
03:23:52 Q. Well, let's spend just a moment talking about that.
03:23:55 A. Sure.
03:24:00 Q. Ma'am, I'm going to show you what I have premarked as
03:24:03 Plaintiff's 262 and also Exhibit 263. Now, if you can take a
03:24:12 moment and look at 263 and let me know, does that appear to you
03:24:17 to be a collection of invoices issued by LaKind Consulting?
03:24:21 A. LaKind Associates. Yeah, it does.
03:24:23 Q. LaKind Associates.
03:24:25 A. Uh-huh.
03:24:25 Q. And, of course, you are the principal of LaKind
03:24:27 Associates, aren't you?
03:24:28 A. I am.
03:24:29 Q. And does that -- those appear to be the invoices you
03:24:32 enter -- that you issued in this case for your consulting work
03:24:36 in this case, right?
03:24:37 A. It does.
03:24:37 Q. Now, if you could also look at Exhibit 262. Do you see
03:24:41 that?
03:24:41 A. I do.
03:24:42 Q. Does that appear to be a table itemizing invoices?
03:24:49 A. You mean summing them?
03:24:51 Q. Does this -- does Exhibit 262 --
03:24:52 A. Yes.

03:24:52 Q. -- appear to be a table which lists out the invoices that
03:24:56 you issued in this case?
03:24:57 A. That's correct.
03:24:59 Q. Okay. Now, we can -- I don't want to have to do this. I
03:25:01 don't think we have to. But will you trust me that this
03:25:05 document, 262, reflects all the invoices that you entered --
03:25:08 issued in this case? And you can match them up by looking at
03:25:11 the other exhibit I handed you.
03:25:13 A. I'm okay with trusting you for this.
03:25:16 Q. Okay. So does it sound about right to you that you've
03:25:18 billed the United States Government -- for your work as an
03:25:20 expert in this case, you billed the United States Government
03:25:29 $1,109,375.07. Does that sound about right?
03:25:32 A. Yeah, it does if you got the fact that I spent over 2,000
03:25:36 hours of work on this thing, yes.
03:25:39 Q. Okay. So $1.1 million to the United States Government.
03:25:42 Let's talk about what the United States Government got for that
03:25:45 money. You, in your work in this case, you put your units in a
03:25:55 way that could be used for an individual risk assessment,
03:25:57 right?
03:26:00 A. I -- let me think about your question for a second. My
03:26:04 units are appropriate for use in -- I'm going to say in a human
03:26:11 health risk assessment. I am not sure at the time that I would
03:26:15 have known it was an individual risk assessment.
03:26:18 Q. And you wouldn't -- and, as a matter of fact, in your

deposition, you expressed skepticism about the ability to use a risk assessment for a specific individual like Mr. Mousser, right?
A. So I don't believe that skepticism actually captures the deposition, but if you have my deposition, I can look at it.
Q. Well, did you -- were you in the courtroom a few moments ago where Mr. Lipscomb testified?
A. Yes.
Q. Okay. Did you hear Mr. Lipscomb say that he's never seen an individual risk assessment successfully conducted?
A. I did hear him say that.
Q. Okay.
A. I don't --
Q. And in your deposition --
A. Excuse me, I'm sorry, I don't know if he said "successfully." That has a different meaning. I think -- but I don't remember exactly how it was worded.
Q. Okay.
A. I think he hadn't seen one, but...
Q. And you've never -- and you talk about your -- this in your deposition, but you never -- you've never seen peer-reviewed literature use an individual risk assessment to make a determination about causation, have you?
A. So I think in my deposition what I said was that I didn't recall that I had seen federal agency documents about that, but

it's not surprising because a lot of risk assessments aren't meant for publication. They're not scientific -- they're frequently not scientific research. It's not the kind of work that goes into a published -- excuse me -- a peer-reviewed journal.

Q. Okay. So you're not familiar with any peer-reviewed literature using a risk assessment to determine causation for an individual, right?

A. Oh, that's a two-part question. So you use risk assessment and causation. I have seen literature on risk assessment for an individual. I have -- I don't think that risk -- in my -- in my world, risk assessments aren't used for causation.

But I want to be really clear that when you had asked me about causation, I was not aware that there was a legal definition of causation. I found that out after. So I think we were using different definitions of causation.

Q. Okay. No, I will -- I will take your answer that you're not used to seeing risk assessments used for individual causation. That's what you just said, right? If so, I can move on.

A. For individual -- for individual, that's -- that's correct.

Q. Okay.

A. Yeah.

Q. But you knew when you -- when you created your report in this case, which you previously -- which you previously sponsored, when you created this report, you put your analysis in terms that could be used for an individual risk assessment; did you not, ma'am?
A. So I believe what I said was I used -- I used a population basis for exposure because that's what I preferred to do. There's -- it doesn't mean that you can't do it for an individual.
Q. Were you aware that another witness in this case, Dr. Bailey, would use your numbers to conduct an individual risk assessment?
A. So I want to be really sure that I understand what you mean by individual risk assessment. So Dr. Bailey could have used my results to do just what I did, to estimate risk for a population very much like Mr. Mousser. When I wrote these reports, I didn't know how she was going to use them.
Q. Okay. All right.
MR. QUINN: I have no further questions. Thank you.
THE COURT: All right. Thank you.
THE WITNESS: Do I leave these things here? Do I leave these things here?
THE COURT: Do --
THE WITNESS: Do I leave these documents here?
THE COURT: If you want.

03:29:26 THE WITNESS: Okay.
03:29:26 THE COURT: That's up to you. They're your documents. I don't care.
03:29:29 THE WITNESS: Thanks.
03:29:33 (The witness exits the witness stand at 3:29 p.m.)
03:29:36 THE COURT: All right. Let's take a recess for ten minutes.
03:29:36 (A recess was taken from 3:29 p.m. to 3:44 p.m.)
03:29:38 THE COURT: Next witness?
03:44:10 MR. TUBIN: Your Honor, I just have to make a quick statement on the record regarding an exhibit mixup.
03:44:15 THE COURT: Okay.
03:44:17 MR. TUBIN: So Lipscomb Demonstrative Exhibit 2012 is now 2014.
03:44:19 THE COURT: All right.
03:44:25 (Defendant's Exhibit Number 2014 received.)
03:44:26 MR. TUBIN: And, Your Honor, the United States calls Dr. Lisa Bailey.
03:44:28 THE COURT: Okay.
03:44:29 MR. SNIDOW: And, Your Honor, just before this witness testifies, I want to draw the Court's attention to Order 884 entered by the four judges. It limits the scope of Dr. Bailey's testimony. The Court held that she's not permitted to testify as to risk assessments or as to margins of exposure. I assume that the Government will abide by that

order, but I wanted to bring it to the Court's attention.

MR. TUBIN: Well, we agree with the order. I do not think it was as broad as risk assessment. The way I understand the language in the Court's order is toxicity criteria and points of departure and any opinions that are dependent upon them.

MR. SNIDOW: Your Honor, I have it, if Your Honor wants to read it, but that is absolutely what the court order held.

THE COURT: This is an order that the four judges signed?

MR. SNIDOW: Correct, Your Honor.

THE COURT: Well, you're bound by that.

MR. TUBIN: Yeah.

THE COURT: So if you violate it, they'll object and I'll disallow it.

MR. TUBIN: Understood, Your Honor.

THE CLERK: Place your left hand on the Bible, raise your right hand and state and spell your name for the record.

THE WITNESS: Lisa Bailey, L-I-S-A B-A-I-L-E-Y.

LISA BAILEY, PH.D.,

was sworn at 3:45 p.m., and testified as follows:

THE COURT: Are you Dr. Bailey?

THE WITNESS: Yes.

THE COURT: Okay. Go ahead.

MR. TUBIN: Thank you, Your Honor.

DIRECT EXAMINATION BY MR. TUBIN:

Q. Would you please state your name?

A. Lisa Bailey.

Q. And can you spell your last name?

A. B-A-I-L-E-Y.

Q. Thank you, Dr. Bailey.

Dr. Bailey, what do you do for a living?

A. I'm a human health risk assessor and toxicologist.

Q. And where did you go to earn your undergrad?

A. I went to Skidmore College, and I have a bachelor's degree in chemistry.

Q. And where did you go next?

A. Massachusetts Institute of Technology, where I received a Ph.D. in biochemistry.

Q. And where did you go after MIT?

A. Harvard School of Public Health, where I did a postdoctoral fellowship.

Q. Did you have a particular focus while you were at MIT and Harvard?

A. Yes, toxic -- biochemistry with a focus in toxicology.

Q. And following your education, what did you start doing?

A. I started doing environmental consulting at Menzie Cura & Associates, which is in Boston.

Q. And what you do next?

03:47:26 A. I went to Gradient, which is the firm that I'm in now, and
03:47:30 do the same type of thing, human health risk assessment and
03:47:33 toxicology.
03:47:34 Q. And can you go into a little bit of detail about the type
03:47:37 of reviews you perform of the literature we've been discussing
03:47:41 today?
03:47:41 A. Yeah, so a lot of the work that I do involves looking at
03:47:45 all of the information that's important for a question of
03:47:49 whether a chemical can cause a health effect or not. So
03:47:52 looking at the animal data, the tox- -- the human data, the
03:47:56 mechanistic data, and also exposure information to determine
03:48:00 whether all of the available literature provides evidence that
03:48:03 a chemical can cause a certain health effect.
03:48:05 Q. And have you published on these areas?
03:48:08 A. Yes.
03:48:09 Q. Approximately how many publications do you have of
03:48:11 peer-reviewed literature?
03:48:13 A. Since my -- since graduating from MIT, probably about 30
03:48:19 publications.
03:48:19 Q. Have you authored textbook chapters on toxicology?
03:48:22 A. Yes, several.
03:48:24 Q. Have you won any recent awards for your research?
03:48:26 A. I did win a recent award from the Society of Toxicology
03:48:31 for an evaluation of a chemical called carbon tetrachloride
03:48:36 that was being evaluated under TSCA.

THE COURT: Used to be used in fire extinguishers.
THE WITNESS: Ah, yes.
THE COURT: Carbon tetrachloride.
THE WITNESS: Yeah.
THE COURT: Well-familiar with it.
THE WITNESS: Okay.
A. So we looked at whether the chemical evaluation that EPA did, whether it -- the concentration that it determined was safe for occupational exposure was safe or not. And we actually calculated what we thought was a safe number based on the best available science.
Q. And, lastly, are you a member of any professional organizations?
A. Yes, Society of Toxicology and Society of Risk Analysis, and I'm also a Fellow of the Academy of Toxicological Sciences.
MR. TUBIN: Your Honor, the United States tenders Dr. Lisa Bailey as a toxicologist and human health risk assessor.
THE COURT: She'll be accepted as an expert and allowed to express her opinions.
Q. Dr. Bailey, can you tell us what your overall opinion is in this case as to specific causation?
A. So I was asked to look at whether the exposures to chemicals in the groundwater at Camp Lejeune would have been high enough to cause Mr. Mousser's kidney cancer, and overall,

03:49:47 my opinion is that the exposure concentrations would not have
03:49:50 been high enough.
03:49:52 Q. And did you prepare a report in this case?
03:49:54 A. Yes.
03:49:55 Q. And do you recognize U.S. Exhibit 946?
03:49:59 A. Yes.
03:50:00 Q. What is that document?
03:50:01 A. That is my report.
03:50:03 MR. TUBIN: Your Honor, I move U.S. 946 into
03:50:06 evidence.
03:50:06 THE COURT: It'll be received.
03:50:06 (Defendant's Exhibit Number 946 received.)
03:50:11 MR. SNIDOW: Your Honor, just for the record, there
03:50:13 are absolute parts of her report that were excluded, so we
03:50:16 object.
03:50:17 THE COURT: Well, what do you mean excluded? By the
03:50:20 Court?
03:50:21 MR. SNIDOW: Yes, Your Honor.
03:50:21 THE COURT: All right. Well, it'll have to conform
03:50:23 to the rule of this case that the judges of this Court have
03:50:29 set.
03:50:30 MR. SNIDOW: Thank you, Your Honor.
03:50:39 Q. (By Mr. Tubin) Dr. Bailey, how do toxicologists determine
03:50:42 what exposure levels are associated with harm?
03:50:47 A. So we look at a lot of information that is available in

the scientific literature, similar to what I was just saying. We look at animal studies, human studies, mechanistic information, and we look for the most reliable studies to help us determine what concentrations can lead to health effects and also what concentrations don't lead to health effects.

Q. Now, what can we -- what can we infer about lower exposures from studies examining higher exposures?

A. Well, it depends. If the studies show that at higher exposures there are health effects and at lower exposures there are no health effects, if that's -- if you see sort of a consistent dose response, meaning no health effects at low concentrations, middle concentrations and then -- but then you're seeing something at a high concentration, then that suggests that -- that you're seeing it only at the higher exposure concentrations.

Q. And is there human data on TCE and kidney cancer related to this?

A. Yes.

Q. And any studies in particular?

A. Well, there's one key study that EPA has used to evaluate risk from TCE with regard to kidney cancer, and that study is called the Charbotel study, and we've heard about that already today.

MR. TUBIN: Your Honor, I've marked Government's U.S. Exhibit 2015 for demonstrative purposes. May I hand some out

to the Court and the other party?

THE COURT: Yes.

Q. All right. Dr. Bailey, on this first page taken from Plaintiff's Exhibit 46, which is the Toxicological Review of Trichloroethylene, how does EPA describe its review of the literature?

A. So in this section, it's talking about how EPA looked at many epidemiology studies on the possible associations between cancer and TCE exposure. And so to do that, they first, you know, collected all of these studies and then looked to see -- looked at the reliability of the studies, the quality of the studies, to determine, you know, how they would inform a weight of evidence evaluation for whether there is cause and effect.

And so they look at a number of things, including exposure assessment approaches, statistical analyses, and potential sources of confounding and bias. And then they determine, you know, what studies are the most reliable, and then those are the studies that they focus on to do the dose-response evaluation.

Q. For your purpose is an exposure analysis, what is the most important, if not near most important, aspect of the study to evaluate?

A. Well, you want to make sure it's a high-quality study, and you want to make sure that there's good exposure information in that study if you're going to determine -- if you want to

03:53:59 1 determine what exposure causes a health effect, you really need
03:54:01 2 a study that has good exposure information for each of the
03:54:04 3 groups.
03:54:05 4 Q. If you'd turn to the next portion of that slide, the next
03:54:08 5 slide, and in this section, how is EPA describing the results
03:54:16 6 of its review?
03:54:18 7 A. It talks about here in the section that there were only
03:54:22 8 two studies that had sufficient exposure response information
03:54:27 9 for a potential dose-response association between TCE and
03:54:30 10 cancer.
03:54:31 11 Q. Can you just elaborate for a minute on what that means?
03:54:36 12 A. So they -- of all of the 50 epidemiology studies that they
03:54:39 13 looked at, they found two studies that they thought were
03:54:42 14 reliable in the sense that they had exposure information and
03:54:47 15 also had estimates of cancer in those groups.
03:54:52 16 Q. And what were those two studies?
03:54:55 17 A. One was Charbotel 2006, which we've talked about today,
03:54:58 18 and the other one was Moore, et al., 2010.
03:55:02 19 Q. And how did the EPA describe the comparison between those
03:55:06 20 two studies?
03:55:08 21 A. They determined that the Moore study did not have
03:55:13 22 quantitatively accurate exposure estimates. Although it was a
03:55:17 23 good study to sort of determine, you know, in the higher group
03:55:19 24 you have cancer, higher-exposed group there's cancer, and
03:55:21 25 lower-exposed group maybe there isn't, so sort of this general

ranking, but they didn't have a good quantitative estimate of exposure in each of those groups. But for the Charbotel study, they did, and that's what you really need.

Q. And, lastly, on this, where they say, "The Charbotel study was selected as the sole basis for the derivation of inhalation unit risk estimate for kidney cancer," what does that mean?

A. It means that EPA used the Charbotel study to calculate what they call an inhalation unit risk value, and it's essentially risk per -- per exposure concentration, and that's what they use to evaluate potential risk at superfund sites for TCEs.

MR. SNIDOW: Objection, Your Honor. This -- I've let her get close to the line, but this is absolutely excluded testimony. If I could just read briefly from the Court's opinion in this case, "Dr. Bailey is not permitted to talk about regulatory values," and that's exactly what she's talking about, and she's about to talk about it more, and she's not allowed.

MR. TUBIN: Your Honor, this is a weight of the evidence of in view of the epidemiological and toxicological literature, similar to what both parties' general causation experts have done today. It's an aspect, and all we're doing is showing why the Charbotel study that has been relied on and talked about repeatedly is reliable.

MR. SNIDOW: If I may, Your Honor, the Court's order

says she's not allowed to give undisclosed general causation of things. That's the whole point of the order. So he's conceded that it falls within the order. She shouldn't be allowed to talk about it.

MR. TUBIN: She's not offering a general causation opinion, Your Honor. She's -- as she stated at the beginning of her testimony, she's here to talk about specific causation that is inherently linked to what is seen in the general causation in comparison to the levels of the individual plaintiff.

THE COURT: Say that again.

MR. TUBIN: Dr. Bailey is comparing Mr. Mousser's level of exposures to what has been seen in the literature to have an effect. That's a specific causation opinion. Part of it touches on general causation, but it is a specific causation opinion.

THE COURT: She's testifying as to specific causation?

MR. SNIDOW: That she can.

THE COURT: And she's barred from talking about general?

MR. SNIDOW: That's correct, certainly, as it pertains to regulatory --

THE COURT: All right. Well, just -- I'll allow her to continue her testimony, but just follow that rule, if you

can make the distinction.

THE WITNESS: Yes.

THE COURT: Okay.

Q. (By Mr. Tubin) Now, Dr. Bailey, this evaluation was in 2011, correct?

A. Correct.

Q. Did the EPA perform another evaluation in 2022?

A. They did in 2020 and 2022 under the Toxic Substances and Control Act for TCE.

Q. And did they have the Camp Lejeune studies from 2014 and 2018 available to them during those reviews?

A. Yes, they did.

Q. And what did the EPA change or say about Charbetol in its 2020 review?

A. They still relied on Charbotel as the most reliable epidemiology study for the association between TCE exposure and cancer.

MR. TUBIN: Your Honor, may I approach?

THE COURT: Yeah.

MR. TUBIN: Thank you.

Q. And, Dr. Bailey, you prepared some demonstratives for the Court today.

MR. TUBIN: If it's okay with Your Honor, I'd like to have Dr. Bailey come down and explain.

THE COURT: Yeah, sure.

03:59:07 THE WITNESS: I don't think you can see it from where you are.
03:59:12 A. Okay. So what I'm showing here is a chart that shows the -- wait a minute. This is not Charbotel.
03:59:22 Q. Which one is this? Wrong slide.
03:59:22 A. Okay. So what I'm showing here is a chart that shows the -- the concentration in the Charbotel study where they have seen an exposure-response relationship, so where a TCE concentration that has resulted in kidney cancer, and that's this bar here, 335. It's called -- it's 335 parts per million year.
03:59:58 And what I'm doing is comparing that to the middle dose in that study, which is around 150 parts per million year, where they also do -- where they did not see an effect, and then I'm comparing that to Mr. Mousser's exposure here, which is very low at around point -- below one parts per million year.
04:00:20 So Mr. Mousser's -- this is essentially showing here that Mr. Mousser's TCE exposure was about 450 times lower than the exposure concentration from Charbotel, where they only saw a dose-response relationship above that concentration. So his exposure was very low.
04:00:39 And I'm just -- to provide some perspective on what that means, I'm going to give you a fold higher. This is the Washington Monument, about 555 feet tall, compared to a person five-foot-five, so about 100 times higher. So that would be

about five Washington Monuments compared to one, so it's a much smaller exposure estimate.

THE COURT: THE COURT: Okay.

Q. Dr. Bailey, if I could have you walk through one more demonstrative while you're still up. Please explain to Judge Boyle the results of the Charbotel study here and their significance.

A. So this is a table from the actual Charbotel study that shows which exposure concentrations are statistically significant and which exposure concentrations are not, and it's showing in bold here the ones that are statistically significant. And I don't know if you remember earlier, we talked about if it doesn't include one, then that's statistically significant. If it does include one, it's not statistically significant. So I'm highlighting in orange here the rows where you see statistically significant risk, and in green where there's not a statistically significant increase. The --

Q. And -- sorry, Dr. Bailey. Go ahead.

A. The only ones where you see a statistically significant increase is at the high group, and that's the 335 ppm year or higher. So this is the -- you know, consistent with what I was showing on my bar graph before, but just not in comparison to Mr. Mousser.

THE COURT: THE COURT: Okay.

Q. Now, what would be different about this if less than one part per million year could cause TCE -- could cause kidney cancer?
A. You would probably see increased risks at these lower groups, and we don't see that. They are not statistically significant.
Q. Thank you, Dr. Bailey.
(The witness returns to the witness stand.)
Q. Now, does any agency classify PCE, benzene or vinyl chloride as carcinogenic to the kidney?
A. No, no agency has said that there is an association.
Q. Were you able to compare plaintiff's PCE exposure to any human data?
A. Yes. I could compare Mr. Mousser's PCE exposure to a study by Hadkhale, which is a bladder -- which evaluated bladder cancer and exposure to different chemicals.
Q. What about his benzene or vinyl chloride exposures?
A. I could compare those to animal studies.
Q. And why only animal studies?
A. There were no human studies for -- sorry, are you talking about TCE or PCE?
Q. TCE still.
A. Oh, sorry. So for TCE, there -- I could only compare to animal doses for -- sorry. For TCE -- sorry. Can you repeat the question?

04:04:02 Q. For benzene or vinyl chloride exposures --
04:04:05 A. Yes.
04:04:06 Q. -- and kidney cancer, renal cell carcinoma.
04:04:11 A. Yeah. Those were only -- I could only look at animal studies because there were no human studies that evaluated exposure concentrations and also kidney cancer for those studies.
04:04:22 Q. And how did those exposures compare to the exposures in the animal studies?
04:04:27 A. Mr. Mousser's exposures were well below the levels in the animals where there were no effects.
04:04:35 Q. Do you know what upper tract urothelial carcinoma is?
04:04:39 A. I've -- I've -- it's not something I study, but it is something that I've heard about mostly in this litigation.
04:04:44 Q. Do you know how it relates to this case?
04:04:47 A. It is the type of cancer that Mr. Mousser has.
04:04:49 Q. Now, are you aware of any human studies on UTUC that could be used to compare Mr. Mousser's exposures in this case?
04:04:54 A. So UTUC, based on the experts, plaintiff experts in this case, has been described as histologically similar to bladder cancer. So we do have bladder cancer studies that we can look at.
04:05:00 Q. And are any of the contaminants, have they ever been associated with bladder cancer?
04:05:06 A. So there is reported by agencies limited and weak evidence
04:05:10
04:05:13
04:05:15
04:05:18
04:05:21

of an association between PCE and bladder cancer.
Q. And do we have reliable human studies on any of the contaminants here in bladder cancer?
A. So we do have an epidemiology study. It's a Hadkhale study. It's a study by Hadkhale, and it does look at the relationship between PCE exposure and bladder cancer, and overall finds that there's no relationship. But what is helpful in that study is that there is also good exposure information for the different groups. So it was a good study to compare it to Mr. Mousser's PCE exposure.
Q. And what is your overall opinion regarding Mr. Mousser's exposure and his UTUC?
A. That his exposures to PCE and TCE were well below concentrations where we would expect to see health effects.
Q. Okay.
MR. TUBIN: Your Honor, I have one more demonstrative, and then I should be --
THE COURT: One more what?
MR. TUBIN: One more demonstrative, and then I should be finished.
THE COURT: All right.
MR. TUBIN: All right. If I could have Dr. Bailey come down and walk through this one as well. Thank you, Your Honor.
A. Okay. So this is a similar chart to what I was showing

04:06:54 you before with the Charbotel study, but this is comparing the
04:06:58 doses in the study by Hadkhale where they looked at the
04:07:02 relationship between PCE exposure and bladder cancer, and I'm
04:07:05 also comparing that to Mr. Mousser's PCE exposure.
04:07:08 So these are the concentrations in the study -- in the
04:07:11 Hadkhale study where they -- they actually -- they saw a
04:07:19 significant effect in the middle dose. They didn't see a
04:07:23 significant effect at the high dose, and they didn't see a
04:07:26 significant effect at the low dose. So that essentially means
04:07:28 that there's no dose response. So you wouldn't -- it sort of
04:07:32 suggests that -- or provides support that there's limited or
04:07:35 weak evidence that there's a relationship between PCE and
04:07:38 bladder cancer.
04:07:38 But I looked at all of these exposure information from the
04:07:44 study to see how it compared to Mr. Mousser's, and
04:07:48 Mr. Mousser's exposure is shown here, and it's about .02 ppm
04:07:52 year compared to the exposure concentrations here are 20.85 ppm
04:07:59 years. It's about 850 times lower than the highest dose here,
04:08:04 but it's also lower than even the lowest dose in that study
04:08:07 where there was really no change.
04:08:09 Q. Okay. And you had one for ingestion as well related to
04:08:12 that study?
04:08:15 A. Ingestion related to the animal study.
04:08:25 Q. All right. And what is the significance of this to your
04:08:27 opinion?

A. So this is showing the no-effect level from the animal studies for ingestion. So the oral dose for an animal study where they saw no relationship, it's about somewhere 1,100 milligram per kilogram day compared to Mr. Mousser's ingestion dose from drinking water of about .0001 milligram per kilogram day. And so it's about a million times lower than the studies in the animal studies where they saw it and no relationship.

Q. Okay. Thank you, Dr. Bailey.

MR. TUBIN: I have a couple concluding questions, and then I will pass the witness.

(The witness returns to the witness stand.)

Q. Dr. Bailey, where did you obtain the information that you used to compare the studies?

A. Dr. LaKind calculated that exposure information that I applied.

Q. And how would you describe Dr. LaKind's calculations?

A. As Dr. LaKind described in her testimony, they are based on conservative models, so they tend to overestimate the exposure for the individual.

Q. The plaintiff says Dr. LaKind's estimates are high and that she assumes more exposure than plaintiff's own expert does. From a toxicological perspective, what's the significance of this?

A. If you're overestimating exposure, then you are -- that's

protective of health. So you want to make sure you're -- it's important to -- if you're going to err on, you know -- if you're going to be uncertain, it's better to be overestimating exposure than underestimating.

MR. TUBIN: Pass the witness.

MR. SNIDOW: Cross --

THE COURT: Any questions?

MR. SNIDOW: -- Your Honor? May I cross-examine, Your Honor?

THE COURT: Yeah.

MR. SNIDOW: Thank you.

CROSS-EXAMINATION BY MR. SNIDOW:

Q. Dr. Bailey, it is a fact, is it not, that you think all of the risks to people at Camp Lejeune were below acceptable levels; is that right?

A. I don't know what you mean by acceptable levels. What acceptable levels are you talking about?

Q. You gave a deposition in this case, right?

A. I did, but I need to understand if you're talking about my risks, which I'm not supposed to be talking about, or you're talking about something else.

Q. Just let me know if you said this in the deposition:

"You calculated the risk to the Camp Lejeune population were below acceptable levels?"

You said, "They were within the acceptable range or below

for cancer risk." Did you say that?

MR. TUBIN: Objection, Your Honor. She needs to know if it relates to the order that she's -- that applies to her.

THE COURT: What are you talking about?

MR. TUBIN: She's --

THE WITNESS: He's talking about risks that I'm not supposed to be talking about.

MR. TUBIN: He's asking her about a portion of her testimony, her deposition testimony, related to risk assessment, which the Court has said she's not permitted to speak about.

THE COURT: Is that right?

MR. SNIDOW: I'm actually not sure, Your Honor, but I'll withdraw the question to avoid this fight --

THE COURT: All right.

MR. SNIDOW: -- and ask another one, if the Court doesn't mind.

Q. (By Mr. Snidow) Let me ask it a different way, Dr. Bailey. You don't believe the exposures were high enough for any of the plaintiffs to be of concern for health effects; is that right?

A. That is the conclusion that I reached based on looking at the exposure information for all of the plaintiffs, yes.

Q. Okay. Now, you have not read the Camp Lejeune Justice Act, correct?

A. It's -- I did not read it cover to cover, no; but it's not

relevant to my scientific opinion, which is based on --
Q. Right. It sounds like you're aware that there is such a thing as the Camp Lejeune --
A. Yes.
Q. -- Justice Act, right?
A. Yes.
Q. And you're aware that the Government has spent hundreds of millions of dollars cleaning up Camp Lejeune, aren't you?
A. Yes.
Q. Okay. But you don't think that any of the people at Camp Lejeune had any reason to think they should be concerned about health effects at all, correct?
MR. TUBIN: Objection. Asked and answered.
THE COURT: Overruled.
A. So I looked at exposures, specific exposures for the 25 plaintiffs in this case. And we're talking today about Mr. Mousser's exposure. So I'm not talking about all of Camp Lejeune. I'm talking I evaluated specific exposures for individual plaintiffs in this case. I can speak only to that exposure.
Q. Did you say what I just read in your deposition, ma'am? Did you say that?
A. Can you read it?
Q. "I don't believe the exposures were high enough for any of the plaintiffs to be of concern for health effects."

04:12:40 A. Yes. For any of the plaintiffs, yes.
04:12:41 Q. Okay. Now, you've given, basically, that same opinion,
04:12:46 "the exposures, gosh, they're just not high enough," a lot of
04:12:49 times in the past, right?
04:12:53 A. I don't know what you mean by a lot of times in the past.
04:12:56 Q. Well, let's start here. You've testified as an expert a
04:12:57 lot, right?
04:13:00 A. I have.
04:13:00 Q. You've evaluated a lot of different chemical and disease
04:13:04 combinations, correct?
04:13:04 A. Yes.
04:13:04 Q. You've worked for a lot of different companies, true?
04:13:09 A. Yes.
04:13:11 Q. You've published papers for companies saying that there
04:13:14 was weak evidence of causation. You've definitely done that,
04:13:16 right?
04:13:17 A. I've published papers based on my evaluation of the
04:13:19 science. And if I reached that conclusion, then that's what I
04:13:21 would have concluded, but it would be based on the science.
04:13:23 Q. And you've reached that conclusion every time, true?
04:13:27 A. All of my evaluations are based on the science, and if
04:13:29 that's every time, then yes.
04:13:31 Q. Okay. So just to be clear, you have never once in your
04:13:35 career published a paper funded by industry where you
04:13:39 determined that there was strong evidence in favor of

causation, have you?
A. That's -- that's very broad. I -- I can't answer that.
Q. You gave a deposition in this case, right?
A. Yes.
Q. And I took it, didn't I?
A. Yes.
Q. And I said, "Have you ever published a paper funded by industry where you determined that there was strong evidence in favor of causation?"
And you said, "I don't recall if that was a conclusion," correct?
A. Yeah, I mean, I have to think about all of my papers, but I mean, it's all based on the science.
Q. Yeah, and you also said -- I said, "Well, have you ever told a company, 'bad news for you guys; this absolutely is a huge public health problem'?"
And you said you've never done that either, right?
A. I don't think I specifically said those words.
Q. All right. You have never published a paper on behalf of a company where you've said, yes, this chemical is likely to cause a certain disease at typical levels of exposure, true?
A. So the types of evaluations that I'm usually involved in are where there is -- we're talking about low exposures and we're talking about whether health effects may be caused at those low exposures, and a lot of times that -- the answer is

04:14:48 no. And if that's the evaluation I'm doing and that's what the
04:14:51 science says, then that's going to be my conclusion.
04:14:53 Q. And my question is just, you've done that every time.
04:14:56 You've never said, yes, I've looked at this chemical at the
04:14:59 relevant level of exposure, and it causes a disease, true?
04:15:02 A. Every time it's been based on the science.
04:15:04 Q. Okay. Well, you work for a company called Gradient,
04:15:07 right?
04:15:08 A. Yes.
04:15:08 Q. And that is a firm that also employs another expert in
04:15:12 this case, Dr. Goodman, true?
04:15:14 A. Yes.
04:15:15 Q. And you've worked with Dr. Goodman before, true?
04:15:17 A. I have.
04:15:17 Q. On other projects, correct?
04:15:20 A. Yes.
04:15:20 Q. And when you worked on those other projects with
04:15:22 Dr. Goodman, you spoke to Dr. Goodman, correct?
04:15:27 A. I would need to know what projects you're talking about.
04:15:29 Q. I'm just saying you've done it before. When you're
04:15:31 working on projects with her, you talk to her?
04:15:32 A. If we're working together, yes. If we're not working
04:15:35 together, then, no.
04:15:37 Q. And here -- she works at your company. You guys both work
04:15:39 at the same -- working on the same case, and I believe your

testimony was you've never once spoken to Dr. Goodman about the Camp Lejeune litigation.
A. I have not.
Q. You've not?
A. We have ethical laws at Gradient where we are not allowed to speak to other experts. It's very common.
Q. Working on the same case?
A. Yes, absolutely.
Q. Okay. Well, your company, Gradient, is it fair to say it has been criticized for misrepresenting the science in the past?
A. I have heard those criticisms. I don't agree with them, however.
Q. So I've got this book called *The Triumph of Doubt*. Have you ever read this?
A. Yeah, I've seen it.
Q. Have you read it?
MR. TUBIN: Objection, Your Honor. I fail to see the relevance of this line of questioning.
THE COURT: It's cross-examination. Sit down.
Q. Have you -- have you read this book, Dr. Bailey?
A. I believe I started to read it, but I didn't finish it.
Q. Okay. And it says that, "Gradient publishes results that look very impressive to their real audiences, judges and juries, but in reality, the guiding principle in these doubt

studies is there's never enough proof; more studies always needed." Do you see that language about your company?
A. That may be written. Again, I don't -- I don't agree with that. It's always based on the science.
Q. Okay. Here's this part: "Gradient also teamed with Exponent to challenge the National Toxicology Program's decision to categorize PFAS as an immune hazard." That happened, right?
A. I was not involved in that, so I --
Q. But you know it happened, right?
A. I don't know.
Q. You don't?
A. It's not something that I was involved in.
Q. "Gradient's team has developed a different viewpoint. It seems like Gradient published something saying lead exposure is not associated with the development of autism." Were you involved in that?
A. It was not something I was involved in.
Q. All right. Let's see, last one. Now, am I correct that this book I have, this is -- this is definitely not the only time that your company has been criticized in the press; is that fair to say?
A. I think -- yes, I think that's fair to say.
Q. Okay. So let me -- are you familiar with a *New York Times* article that describes the company that you work for as a group

of rented white coats?
A. Yes, I'm familiar with that.
Q. And before you started working for the Government, did you -- did you tell them that -- that your firm had been criticized in these ways?
A. That's not something that I brought up, no.
Q. So that's a no?
A. No, it's a no. I mean, I -- my work is based on the science.
Q. Okay. And you're aware that your firm has charged the Government more than a million dollars for the work that you spent in this case, true?
A. Yes.
Q. And are you an equity owner of Gradient?
A. I'm a principal at Gradient, which means I'm an owner, yes.
Q. I'm sorry. I didn't hear the last part of your answer.
A. I'm a principal at Gradient, so I am one of the owners, yes.
Q. Okay. And are you aware that Dr. Goodman has billed the United States Government just shy of $7 million in this case?
A. I'm not aware of the amount that she has billed.
Q. So you're a -- you're a -- you're an owner of this business, true?
A. I don't -- I'm not involved in the finances.

Q. You have an equity stake in this company, correct?
A. Yes, but I don't -- I cannot look at individual projects and how much is billed.
Q. You mean to tell me, as an owner of the company, you weren't aware that one of your colleagues billed the United States Government just shy of $7 million in this case?
A. Yeah, I did not know that.
Q. Okay. All right. Now, you did a little copy-and-paste in your report; is that right?
A. I'm not sure what you mean by that.
Q. Well, I asked you in your deposition, "Did you copy and paste any sections of your report for one plaintiff into another?"
And you said, "Some of the general sections I did, yes."
A. Oh, in the general sections, yes, where it was-- I had 25 reports and the -- like, the Camp Lejeune sections were going to be the same for every report.
Q. And it's a little more serious than that, isn't it, Dr. Bailey?
A. I don't know what you mean by that.
Q. Okay. Well, you looked at 25 different plaintiffs in this litigation, correct?
A. Yes.
Q. And you gave the exact same conclusion every time, except -- correct me if I'm wrong on this -- for the kidney

cancer plaintiffs, you did swap out the plaintiff's name, you did swap out the number of years they spent on base, and then you gave the same conclusion verbatim?

A. You're mischaracterizing my report.

Q. All right. Well, I'm going to read from your report you wrote for Mr. Mousser.

"Based on the results of my analysis described above, it is my opinion to a reasonable degree of scientific certainty that there is insufficient evidence to conclude that Mr. Mousser's exposure to TCE, PCE, benzene, vinyl chloride and 1,2-DCE from tap water during the 3.1 years that he was stationed at the Camp Lejeune are causally associated with his kidney cancer."

That's what you wrote for Mr. Mousser, right?

A. So this is a final statement that I have in my report that is very similar to everyone's, but there are many, many sections before that where I go specifically into the exposures for each of the individuals, similar to what I was just explaining there.

In the end, yes. I mean, in a few sentences, I'm summarizing the various sections and drawing my conclusions, but that's not all I'm saying. My reports are hundred -- a hundred pages long.

Q. That's all I'm asking. Your conclusions, you swapped out the name, you swapped out the years. Otherwise, exactly

identical, right?
A. You're mischaracterizing the rest of my report --
Q. Well, I'm not talking about the rest of your report.
A. -- by focusing on that section.
Q. I'm talking about the conclusion, and what I said is correct, right?
A. I suppose so, but that's -- that's not -- that's not all of my report --
Q. All right.
A. -- because it's -- I did a very thorough evaluation of exposure for each individual.
Q. You never published a paper on kidney cancer, right?
A. I did not, but I've done lots of -- I've been involved in lots of projects where I have had to think about kidney cancer in various --
Q. You've never described yourself to another expert as an expert in kidney cancer, have you?
A. I have not, but I'm an expert in risk assessment and toxicology, and I can certainly evaluate the data that support evaluating that question.
Q. Now, Dr. Bailey, you made a materials considered list, correct?
A. Yes.
Q. And I assume those are the materials that you considered in this case, right?

04:21:59 A. Yes.
04:22:00 Q. And am I correct that you did not read every single
04:22:03 article on your materials considered list from cover to cover?
04:22:07 A. I probably did not read every single article cover to
04:22:10 cover. I certainly read everything in my report, but there
04:22:13 were lots of other things that I considered, that I did look
04:22:17 at, but probably did not read every single word of.
04:22:19 Q. All right. You've been an expert witness between 50 and
04:22:22 100 times, right?
04:22:25 A. I have not been deposed that many times. I'm not sure
04:22:29 what you're asking. In terms of report writing or deposition
04:22:33 testimony?
04:22:34 Q. I asked you in your deposition -- I was looking for a
04:22:36 ballpark -- "Is 100 a reasonable estimate?"
04:22:37 And you said, "I have between -- say, between 50 and 100,
04:22:40 maybe not quite 100," right?
04:22:42 A. Probably in terms of reports that I've written, yes.
04:22:44 Q. You've done work for the American Petroleum Institute,
04:22:46 correct?
04:22:47 A. I have done reports for them.
04:22:49 Q. The American Chemistry Council, correct?
04:22:50 A. Yes.
04:22:51 Q. You've done work as an -- on asbestos, correct?
04:22:54 A. I have.
04:22:54 Q. And let me get this right. You've published that

04:22:57 chrysotile asbestos does not cause mesothelioma, true?
04:23:03 A. So there is evidence to support that, yes, and it's based on the science.
04:23:06 Q. Okay. You --
04:23:06 A. And I can go over it, if you want, but...
04:23:09 Q. I don't want to go over the science.
04:23:10 A. Okay.
04:23:10 Q. I want to go over the fact that --
04:23:11 A. That's what it's based on.
04:23:12 Q. -- international organizations completely disagree with you on that, true?
04:23:14 A. Not necessarily.
04:23:18 Q. Okay. Dr. Goodman published that paper with you, correct?
04:23:19 A. I'm not sure what paper it is specifically.
04:23:24 Q. All right. You've done work for the Manganese Interest Group, yes?
04:23:26 A. Yes.
04:23:27 Q. That's a trade group for companies who deal with manganese, I assume, yes?
04:23:28 A. Yes.
04:23:29 Q. You published a paper on manganese regulation for them, correct?
04:23:32 A. Yes.
04:23:33 Q. And you -- you actually let the manganese trade group comment on the manuscript before it was published, didn't you?
04:23:33
04:23:37
04:23:37
04:23:38
04:23:42

04:23:47 A. I -- I mean, they will some -- yes, they will sometimes
04:23:50 review our papers and look at them in terms of, you know, just
04:23:57 to make sure that -- that -- that the way we're presenting
04:24:00 things is clear. But in the end, the science is -- is -- and
04:24:04 the evaluation is mine.
04:24:06 Q. You've done work for the Formaldehyde Council, correct?
04:24:10 A. Yes, a number of years ago.
04:24:11 Q. I assume that's a trade group for companies who deal with
04:24:13 formaldehyde, correct?
04:24:15 A. Yes.
04:24:15 Q. And they asked you to look at whether formaldehyde causes
04:24:19 leukemia, true?
04:24:20 A. Yes.
04:24:22 Q. And you told them no, right?
04:24:24 A. Based on the weight of evidence evaluation that we did,
04:24:27 based on a lot of data that we looked at.
04:24:29 Q. All right. You've done work for the Naphthalene Research
04:24:32 Committee, true?
04:24:32 A. Yes.
04:24:33 Q. They deal with naphthalene, I assume?
04:24:35 A. Yes.
04:24:36 Q. You let them review the manuscript before you published
04:24:38 it, correct?
04:24:40 A. I don't recall if they reviewed it, actually. They may
04:24:43 have, but, again, it's just -- it's not for the science. It's

not for interpretation of the science.
Q. You decided that naphthalene didn't cause cancer in humans at the relevant levels of exposure, right?
A. Well, it was not a decision. It was based on the science.
Q. You've done work --
A. Based on my evaluation and interpretation of the available data.
Q. You've done work for Dow AgroSciences, correct?
A. I don't recall, actually.
Q. They asked you to look at a pesticide called chlorpyrifos, true?
A. So I was involved in that project, but my role was to more generally describe how we do a weight of evidence evaluation. I was not involved in the science.
Q. All right. Well, Gradient was, correct?
A. Yes.
Q. And you determined chlorpyrifos does not cause neurodevelopmental problems, right?
A. Well, I was -- like I said, I was not involved in the evaluation of the science for that paper.
Q. You've looked at the relationship between methyl -- methyl lactate and human levels of exposure, correct?
A. Yes.
Q. And you, again, determined that there was not human risk at low levels of exposure, true?

04:25:45 A. Well, we determined what levels of exposure were a problem
04:25:48 and which were not. I mean, for all of these studies, that's
04:25:50 what I'm doing. I'm looking at what exposure concentrations
04:25:53 cause health effects, which ones do not, and that's what the
04:25:56 paper is based on.
04:25:58 Q. You've got a kind of quota at Gradient in terms of revenue
04:26:03 that you're supposed to hit in a year, right?
04:26:07 A. We have a target.
04:26:08 Q. Yeah, and your revenue target, at least at the time of
04:26:11 your deposition, was $750,000 a year, correct?
04:26:15 A. Yeah, I think that sounds correct.
04:26:17 Q. And am I correct between you and Dr. Goodman, your firm,
04:26:22 that you are a business owner of, has billed the Government
04:26:28 nearly $10 million?
04:26:31 A. I don't -- $10 billion?
04:26:34 Q. $10 million.
04:26:37 A. Oh. I -- I don't know -- as I said, I don't know what
04:26:41 Dr. Goodman's billing was, but I know that -- what mine was,
04:26:44 yes.
04:26:45 Q. Okay. Now, in this case, you did not actually do an
04:26:51 independent literature search, true?
04:26:53 A. I did not because I was not asked to do that. I relied on
04:26:57 Dr. Goodman's report.
04:26:58 Q. And that's what I was going to say. The Government kind
04:27:02 of defined what you and Dr. Goodman were going to do; is that

04:27:05 fair?
04:27:07 A. Well, I was not a general causation expert, so I did not
04:27:11 review all of the information related to the chemical and
04:27:16 cancer of concern. So that was what the general causation
04:27:18 expert -- what I did was looked at the exposure and evaluated
04:27:22 possible health effects.
04:27:24 Q. So you did not do a systematic review of the epidemiology,
04:27:28 correct?
04:27:29 A. I did not, no.
04:27:30 Q. That was Dr. Goodman, correct?
04:27:32 A. For this litigation, yes.
04:27:33 Q. But you absolutely relied on Dr. Goodman's assessment of
04:27:39 the quality of the studies, true?
04:27:42 A. I do, but I also looked at, like, EPA's evaluation of all
04:27:48 of the data, and they ended up at the same place, with
04:27:51 Charbotel as being the most reliable study. So it's not just
04:27:54 based on Dr. Goodman's. And also, Dr. Shields, who was
04:27:58 testifying earlier, also spoke to how reliable the Charbotel
04:28:03 study is. So it wasn't entirely based on Dr. Goodman. It was
04:28:05 based on the agency reports, other experts in the case.
04:28:11 Q. I asked -- I asked you in your deposition, "So the
04:28:13 universe of epidemiology literature you considered was limited
04:28:18 to Dr. Goodman's review?"
04:28:20 And you said, "Yes, it was," right?
04:28:21 A. At that time, it was.

04:28:23 Q. Okay.
04:28:23 A. But now I have also heard Dr. Shields's testimony, and I understand that he also is pointing to Charbotel as a reliable study. And in my report, I also talk about the EPA evaluation, where they used Charbotel as the study to derive their toxicity value. So it's pretty clear even in my report that I'm not just relying on Dr. Goodman.
04:28:45 Q. Wait. Wait a minute. You heard Dr. Shields testify today? Is that what you're saying?
04:28:51 A. About Charbotel?
04:28:52 Q. Yeah. That's what you were saying, you heard him today?
04:28:56 A. I did hear him today.
04:28:58 Q. But at the time of your report, you relied entirely on Dr. Goodman's evaluation of the epidemiology, correct?
04:29:03 A. I did.
04:29:04 Q. Okay. In particular, you were relying on her tables at the end, correct?
04:29:10 A. Yes.
04:29:10 Q. And am I -- are you aware that Dr. Goodman had 300 errors? Three-hundred errors.
04:29:18 A. I'm aware that there were a number of corrections that needed to be made in her reports.
04:29:21 Q. Well --
04:29:21 A. They did not change her opinions, and they did not change --

Q. How do you know that? You never talked to her about this case.
A. That is my understanding from talking to the attorneys in this case.
Q. Oh, they told you it didn't change her opinions?
A. I also looked at the error -- at the corrections myself --
Q. Oh.
A. -- and I could tell that they would not have changed her opinions, and they did not change my opinions.
Q. You could tell that the 300 errors that she made in her report wouldn't have changed her opinions when you never talked to her about the case?
A. So they were all in the tables. They were not in the text. If they changed her overall opinion, that would have been written in the text, and there was nothing written in the text that said that her opinions changed. The only change --
Q. Okay. Now, let me ask you this, Dr. Bailey --
A. -- would have been in the tables.
Q. I didn't mean to interrupt. Let me ask you this: Are you aware that Dr. Goodman is not going to be testifying in this trial?
A. I'm aware that Dr. Goodman is not here.
MR. TUBIN: Objection, Your Honor.
MR. SNIDOW: She just said she's aware.
THE COURT: What?

A. I'm aware that she's not here. I'm not aware of any final decision on her testimony.

THE COURT: Overruled.

Q. Okay. Now, the -- you alluded to this, but I just want the record to be clear on this because I asked you in your deposition. The Government asked you to rely on Dr. Goodman's report, true?

A. Yes. For the epidemiology and the animal studies, yes.

Q. You are deferring to Dr. Goodman about whether a certain study is reliable, true?

A. I'm -- so I'm looking to Dr. Goodman's reports as an evaluation of all of the available data, and if -- if they're reliable, yes, I'm relying on her for that evaluation. And I -- I agree with her methodology.

Q. Well, we'll get to her methodology in a moment. I'd like a clean answer on this, if you don't mind. Did you defer to Dr. Goodman's interpretation of what studies were reliable, yes or no?

A. Yes, for the most part, I did.

Q. Okay. Now, you mentioned that you agree with her methodology, correct?

A. Yes.

Q. You know that her methodology was a weight of the evidence evaluation, true?

A. It's a weight -- yeah. It's what EPA does. It's what a

lot of scientists do who are evaluating whether a potential -- whether a chemical may cause a health effect.

Q. And when doing a weight of the evidence evaluation, you have to weigh the evidence, some more strongly and some less strongly, fair?

A. Yes, but you need to consider all of it.

Q. And you can't do that without actually reviewing all of the evidence; wouldn't you agree?

A. Yes, you can. Well, if you're the one doing the analysis, then you're doing -- you're weighing the evidence, so yes.

Q. My question is this: You have to actually review all the evidence to do a weight of the evidence analysis, correct?

A. Yes.

Q. That kind of evaluation requires the exercise of judgment, true?

A. Scientific judgment based on available information.

Q. To determine whether a study is reliable, that also requires scientific judgment, correct?

A. Based on criteria that are important for determining whether a study is of high quality or not.

Q. I asked you in your deposition: "That absolutely requires scientific judgment to determine what studies are reliable or not, right?"

And you said, "Yes," correct?

A. It -- yes.

04:32:40 Q. Yeah.
04:32:40 A. But it's -- it's not just random judgment. It's based on
04:32:44 experience and the understanding of what a study quality is --
04:32:47 Q. It --
04:32:47 A. -- what good study quality is.
04:32:49 Q. You did not independently verify that you agree with
04:32:53 Dr. Goodman's judgment, correct?
04:32:55 A. So, again, I agree with her methodology. So she reviewed
04:33:00 all of the information. I know the study quality criteria that
04:33:02 she used to determine whether studies were reliable. She had
04:33:06 many studies in her report that she summarized, and her -- I --
04:33:12 I agree with her conclusions based on the fact that her
04:33:16 methodology was sound.
04:33:17 Q. I asked you at your deposition: "You did not
04:33:20 independently verify that you agreed with Dr. Goodman's
04:33:22 judgment?"
04:33:22 You said, "I did not independently verify," correct?
04:33:25 A. Because I did not look at the studies myself because that
04:33:28 was not what I was asked to do, but I can certainly rely on her
04:33:31 evaluation where I trust her methodology.
04:33:33 Q. Well, you didn't even review every page of Dr. Goodman's
04:33:36 reports, did you?
04:33:39 A. I mostly focused on the tables because that's where --
04:33:41 that was the most important information for my evaluation. I
04:33:45 needed the exposure information.

04:33:46 Q. Well, the tables we talked about. They had 300 errors in
04:33:49 them, right?
04:33:50 A. Not in the studies that I used.
04:33:51 Q. All right. Well, that's not true, is it, Dr. Bailey?
04:33:55 A. No, that is true.
04:33:55 Q. Okay. In any event, aside from the tables, you did not
04:33:59 review every page of Dr. Goodman's report, right?
04:34:03 A. I looked at Doctor Goodman's reports, and I reviewed all
04:34:06 of the sections and all of the tables.
04:34:08 Q. Okay.
04:34:09 A. I haven't memorized them from cover to cover.
04:34:13 Q. All right. Now, on direct, you showed the Court -- you
04:34:21 showed the Court this slide here. Let me just get it closer.
04:34:48 You showed that one, right?
04:34:51 A. Yes.
04:34:52 Q. Okay. Now, we can agree, this is absolutely not the only
04:34:58 study looking at the link between TCE and kidney cancer,
04:35:02 correct?
04:35:04 A. It's not the only study that evaluated that potential
04:35:07 relationship, but it is the one that's the most reliable based
04:35:10 on EPA's weight of evidence evaluation of all of the data.
04:35:13 Q. Okay. The Bove studies looked at TCE and kidney cancer,
04:35:16 correct?
04:35:18 A. And EPA looked at those studies, considered them in their
04:35:21 2020 evaluation, but did not determine that they were reliable

for doing this type of analysis.
Q. Well, first of all, look, the Bove 2024 study wasn't even published in 2020, correct?
A. The other ones were.
Q. Yeah. And those aren't the only ones, though. The Andrew study, the Moore study, Raasch-Nielsen study, this has been looked at hundreds of times in the literature, correct?
A. There are -- those studies do exist, but there are problems with those studies.
Q. There's problems with every single study that you couldn't use them to compare for the judge?
A. Well, we were talking about earlier how it's important to have exposure information that's specific to the individuals in the study. So for Charbotel, you have good exposure information for the -- for each individual person, and then you can tie that to whether they have kidney cancer or not.
For the Bove study, there -- there are -- there's no individual exposure information for those studies, so you can't -- for the people who have cancer, you don't know how much they've even taken in of the drinking water.
Q. Let me ask it -- you this way, Dr. Bailey: Did you compare my client, Frank Mousser's exposure, to any study, other than Charbotel?
A. Um...
Q. Yes or no; did you?

04:36:39 A. Not for TCE, only Charbotel because that's the most
04:36:41 reliable study that EPA has.
04:36:44 Q. Okay. Now, let's talk about this Charbotel study. First
04:36:48 of all, you decided to use Charbotel because that's the one
04:36:52 that Dr. Goodman relied on, correct?
04:36:55 A. I used it because that's the one that EPA relies on.
04:36:57 Q. And Dr. Goodman, right? You said that.
04:37:00 A. Mostly EPA.
04:37:01 Q. In your deposition, you said you relied on Dr. Goodman,
04:37:03 right?
04:37:04 A. I relied on Dr. Goodman for her evaluation of all of the
04:37:07 information, but in terms of the study, she ended up landing on
04:37:10 the same study as EPA, so that suggests that it's a reliable
04:37:14 study. Not just from Dr. Goodman, but from EPA.
04:37:17 Q. Okay. Now, I'm going to come back to Charbotel, but I
04:37:19 want to switch gears for one moment. We have heard a lot of
04:37:24 questions in this case about whether Mr. Mousser's cancer,
04:37:28 upper tract urothelial cancer, should be considered kidney
04:37:32 cancer or bladder cancer, okay?
04:37:35 Now, in your report for Mr. Mousser, do you describe his
04:37:41 cancer as kidney cancer or bladder cancer?
04:37:45 A. I describe it as kidney cancer, as it was described to me.
04:37:49 Q. In fact, you described it as kidney cancer dozens of times
04:37:51 in your report, right?
04:37:52 A. Yes.

04:37:54 Q. And you never described it as bladder cancer, right?
04:37:55 A. I did not.
04:37:59 Q. Now, that's fine, but when you went to compare
04:38:03 Mr. Mousser's exposure to the epidemiology, you chose to
04:38:09 compare it to Charbotel, and could you tell the Court, is
04:38:13 Charbotel, is that a kidney study or a bladder study?
04:38:18 A. That's a kidney study.
04:38:19 Q. Kidney study. And, in fact, Dr. Goodman, she said to use
04:38:26 bladder cancer for this type of cancer -- yeah, bladder cancer
04:38:31 epidemiology for this type of cancer, right?
04:38:34 A. I don't recall if that's what Dr. Goodman said.
04:38:37 Q. Okay. In any event, though, you decided to use kidney
04:38:41 cancer epidemiology to evaluate Mr. Mousser's cancer, right?
04:38:46 A. Yes, because that's what is being claimed in this -- in
04:38:49 this case.
04:38:50 Q. All right. Now, you think that this Charbotel study
04:38:57 establishes a threshold, true?
04:39:00 A. So it establishes a concentration above which effects were
04:39:04 seen and below which effects were not seen. You can call that
04:39:06 a threshold. You can call that whatever you want to call it.
04:39:09 But it's a concentration above which effects were reported in
04:39:12 the study and below which they were not.
04:39:15 Q. Well, you've called it a threshold, right?
04:39:17 A. No, I'm calling it a threshold --
04:39:18 Q. Oh.

A. -- but I'm describing to you what I mean by that.
Q. And just so the Court understands, a threshold means a level below which there is no risk of cancer, right?
A. In that particular study, yes.
Q. So if the exposure is above the threshold, then there might be a risk; if the exposure is below the threshold, there will not be a risk, true?
A. That's how we're describing it with respect to this study, yes.
Q. And you think that TCE has a threshold, true?
A. So --
Q. Sorry. First of all, do you think TCE has a threshold?
A. I think that there is -- yes, that even -- even chemicals that react with DNA have thresholds. I think all chemicals have some concentration below which our bodies can manage that toxin, and it won't cause health effects, and that's essentially a threshold.
Q. So what's the threshold?
A. It's a concentration below which health effects are -- would not be expected.
Q. No, what's -- what's the threshold for TCE?
A. Oh, for TCE. So there's a threshold that we're -- that I'm talking about in this epidemiology study. It's 335 ppm year. And in that study, the concentration -- below that concentration, there's no health effect. And I'm not sure what

04:40:30 you're talking about in terms of threshold.
04:40:33 Q. Well, I asked you in your deposition, "So what's the
04:40:34 threshold dose for TCE and kidney cancer?"
04:40:37 And you said, "I don't know," correct?
04:40:39 A. So --
04:40:39 Q. Wait. Did you say that?
04:40:41 A. I need the context. I need more context of what you're
04:40:44 talking -- of what --
04:40:45 Q. Do you want to see it?
04:40:45 A. -- that questioning was around because I think it was
04:40:47 around EPA's toxicity value, which I think I can't be talking
04:40:52 about here.
04:40:52 Q. Do you want to see the deposition?
04:40:53 A. (Nods head.)
04:40:53 Q. Okay. I'm showing your deposition, which occurred in the
04:41:01 summer of in 2025, I believe.
04:41:04 (Brief pause.)
04:41:04 MR. SNIDOW: Apologies, Your Honor. I grabbed the
04:41:04 wrong document.
04:41:04 Q. If you go to page 130 on your deposition, I asked you, "So
04:42:05 what's the threshold dose for TCE and kidney cancer?"
04:42:08 And you said, "I don't know."
04:42:09 A. Well, I --
04:42:09 Q. Did I read that correctly? Did I read it correctly?
04:42:11 A. You read that part, but what I'm saying is I don't

understand the whole context -- that whole section that we were talking about, and it could have been about the inhalation unit risk value and EPA's no safe dose and that type of thing.

Q. Okay. Now, you cannot -- you -- you know that the scientific community says that there is no threshold for TCE, correct?

A. So --

Q. Is what I said correct?

A. -- the regulatory -- that is not correct.

Q. It's not correct?

The European Chemical Agency says, "Due to the non-threshold nature of the substance, the exposure of workers and consumers should be as low as possible," right?

A. So there is within the regulatory community -- the regulatory agencies are -- they need to be protecting public health. So they assume that based on the Charbotel study, you -- that's the starting point. And they say that since we don't know the concentration below, you know -- within a population, we don't know exactly where you have no DNA damage, no -- or sorry -- where you have -- where there is no -- where the toxins are going to be removed completely from the body, no DNA damage, no mutations, they don't know exactly where that is because that's a very low concentration. It doesn't mean that above that, you have health effects, but there's some level where you have really no effect, and that's very low. And so

because they don't know that, they have -- they draw a line from the point of departure, and that's also a level where there's no effect, and they just draw a straight line down to the bottom.

Q. Are you finished?

A. Yes.

Q. The European Chemical Agency says, "Trichloroethylene is a non-threshold carcinogen for which no threshold can be determined below which exposure would be safe," right?

A. So it's a -- again, it's a public policy decision. It doesn't mean that there is -- that there's a health risk at every concentration. It just means that that's what they decide from a regulatory perspective, that they're going to calculate a non-zero risk above -- at any concentration, but some of those risks are within background levels of cancer risk, or even below.

Q. You can't name any authority that says there's a threshold dose for TCE, correct?

A. Not as I'm sitting here today, no.

Q. Okay. You did not compare Mr. Mousser's exposure to the Moore 2010 study, did you?

A. I did not specifically do that, no.

Q. You did not compare Mr. Mousser's exposure to the Andrew study, correct?

A. I -- no, I did not do that because there were -- I mean,

again, that's a study where I believe that there was no individual exposure information in that study.
Q. I'm just asking if you did it. You didn't do it, right?
A. There was -- there wasn't a reliable way to do that.
Q. You didn't compare Mr. Mousser's exposure to the Aschengrau study, correct?
A. Again, that's not a study that I would consider reliable, so, no, it's not something that I did.
Q. And in total, you compared my client's exposure to one single study in the literature, and it was a kidney cancer study, right?
A. It's the most reliable study when you look at all of the literature together. It was not just chosen with no reason. It was based on weight of evidence, evaluation of all of the data, and it comes up as the most reliable study, according to EPA and general causation experts in this case.
Q. I want to close by talking about some other things that people have written about Gradient, and in particular, Dr. Goodman. You know that the International Epidemiology position statement on conflict of interest -- have you seen that?
A. I'm not specifically aware of that.
Q. Okay. It says, "They exposed Dr. Julie Goodman giving expert testimony, citing junk science and financially benefiting from vested interests of her employer, Gradient."

That's -- that's your employer, right?
A. That is my employer, but I'm not aware of that.
Q. It says, "Gradient has long been associated with scientists employed to manufacture doubt and foment uncertainty about scientific evidence," right?
A. That may be written there, but I don't agree with it.
Q. You don't agree with that, okay. Then they -- they actually published a whole position statement kind of about your company. It says, "Science can be misused either intentionally, through error, from bias." It says, "It's been done by the lead industry and the tobacco industry." Gradient works for both of those, right?
A. I'm -- I have not worked for the lead industry or the tobacco industry at Gradient.
Q. Okay. It says that there's an exposé about Dr. Goodman giving expert testimony that cited junk science. Are you familiar with that exposé?
A. No.
Q. You haven't seen that?
A. I don't recall that, no, I don't.
Q. Okay. Then this "Meet the Rented White Coats" article that we talked about that was -- that was published a couple of years ago, there's a quote here that, "Dr. Goodman had offered no proof and was just making stuff up." Have you heard that?
A. I have not heard that.

Q. It says that, "It seems like you can just make up your own facts now. Mrs. Goodman and the company she works for have a reputation of misrepresenting the science consistently." Have you heard that said about your company?
A. I hear what you're reading, and I have heard it, but I -- of course, again --
Q. Yeah.
A. -- I don't agree with it because we do our evaluations based on the science.
Q. Okay.
MR. SNIDOW: Your Honor, I have no further questions.
THE COURT: All right. Is that it for this witness?
MR. TUBIN: I'm sorry, Your Honor?
THE COURT: Is that it for this witness?
MR. TUBIN: I have one question that I'd like --
THE COURT: All right. Go ahead and ask it.
REDIRECT EXAMINATION BY MR. TUBIN:
Q. Dr. Bailey, I'd like to give you an opportunity to look at the entirety of your testimony that counsel directed you to. See on page 130, is that what he referred you to?
A. Let's see, yes.
Q. Can you take a moment and read the preceding paragraph?
A. Am I reading that out loud, or?
Q. You can read it silently to yourself.
A. Okay.

Q. Just look up when you're done.
A. (Witness reviews document.) Yes, it's essentially what I said.
Q. Would you like to elaborate on the full context?
A. Yeah, I mean, so it's difficult for EPA to know exactly where that threshold is for cancer causation. So they draw a line from a point in the study where they know that there is not a relationship, and they draw a line straight down, and then they can -- so that you can calculate a risk at any of those points on that curve. But that doesn't mean that they think that there's a risk at all of those levels. So it's -- that line is going below a threshold. It's going below where health effects --
Q. Okay.
A. -- are likely to occur.
THE COURT: Is that it?
MR. TUBIN: That's it, Your Honor.
THE COURT: All right. We're going to recess for the day. What kind of witnesses do you have tomorrow?
MR. BAIN: Your Honor, we're mostly moving on to damages, we have three very short Government fact witnesses on the offset issue. Then we have our vocational rehab expert and our economist. Those are fairly short witnesses as well. And then finally --
THE COURT: You keep denominating people as short

witnesses and yet we're here at 5 o'clock.

MR. BAIN: Yes, Your Honor.

THE COURT: So you were supposed to have eight short witnesses today, so anyway.

MR. BAIN: I appreciate it, Your Honor. We're going to finish up tomorrow. And Dr. Stadler, who I mentioned who had the surgery, he's here. He'll be here tonight --

THE COURT: Okay.

MR. BAIN: -- and he'll be available tomorrow.

And then we have -- also, Your Honor, we are also going to have some depositions, as the plaintiffs did. We'd like to, you know, explain what they are and then submit them.

THE COURT: All right. Well, we'll try to get it finished tomorrow.

MR. BAIN: Thank you, Your Honor.

THE COURT: Court will be in recess.

MR. SNIDOW: Thank you, Your Honor.

(An overnight recess was taken at 4:50 p.m.)