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UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF LOUISIANA

IN RE: OIL SPILL BY THE OIL RIG	*	Docket 10-MD-2179
DEEPWATER HORIZON IN THE	*	
GULF OF MEXICO ON APRIL 20, 2010	*	Section J
	*	
Applies to:	*	New Orleans, Louisiana
	*	
Docket 10-CV-02771,	*	October 10, 2013
IN RE: THE COMPLAINT AND	*	
PETITION OF TRITON ASSET	*	
LEASING GmbH, et al.	*	
	*	
Docket 10-CV-4536,	*	
UNITED STATES OF AMERICA v.	*	
BP EXPLORATION & PRODUCTION,	*	
INC., et al.	*	
	*	
* * * * *		

DAY 8, AFTERNOON SESSION
TRANSCRIPT OF NONJURY TRIAL BEFORE
THE HONORABLE CARL J. BARBIER
UNITED STATES DISTRICT JUDGE

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25 computer-aided transcription software.

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1 AFTERNOON SESSION

2 (October 10, 2013)

3 * * * * *

01:03 4 THE DEPUTY CLERK: All rise.

01:28 5 THE COURT: All right. Please be seated, everyone.

01:28 6 MS. HIMMELHOCH: Mr. Brock, if you could raise this
01:28 7 issue now because it affects what our lawyers are going to do
01:28 8 the rest of the day.

01:28 9 THE COURT: Any preliminary matters?

01:28 10 MR. BROCK: I did have one, Judge.

01:28 11 THE COURT: I got a message. I think I know what
01:28 12 you're going to say, but go ahead.

01:28 13 MR. BROCK: Yes, sir. Our witness is here and ready
01:28 14 to go, but our examiner for the next witness, Dr. Whitson, is
01:29 15 ill and we thought she was going to be okay to do this. She
01:29 16 did come over this morning, but we have sent her back to bed.
01:29 17 So --

01:29 18 THE COURT: Is that Ms. Karis?

01:29 19 MR. BROCK: That is, yes, sir. So I've talked to the
01:29 20 United States about this. I have said, of course, this is for
01:29 21 you to decide, but we'd be willing to bring him to be the first
01:29 22 witness Tuesday or put him back in the order where he was,
01:29 23 whatever their preference is to accommodate this.

01:29 24 Their preference was to bring him in first thing
01:29 25 Tuesday morning, just leave him where he is in the sequence.

01:29 1 Instead of testifying this afternoon, he would go first thing
01:29 2 Tuesday, and then we'd be right back on our order right
01:29 3 through.

01:29 4 And as I mentioned to Ben, I understand the idea
01:29 5 of keeping things going. I could send someone out to meet with
01:29 6 him for a couple of hours, but it would basically be a
01:29 7 situation where we would just be reading questions, and it's
01:29 8 really difficult to do a redirect if you're in that situation.

01:30 9 So I was going to ask if it was okay with
01:30 10 Your Honor just to move that over to Tuesday morning.

01:30 11 **THE COURT:** All right. Is the government's
01:30 12 preference that if he can't testify today, he be the first
01:30 13 witness Tuesday morning?

01:30 14 **MS. HIMMELHOCH:** Yes, Your Honor. We have it prepped
01:30 15 for the next crosses, so that would be our preference.

01:30 16 **THE COURT:** Okay.

01:30 17 **MR. BROCK:** I do have -- after this witness, I do
01:30 18 have about 30 minutes of tape ready to go. I can play that
01:30 19 this afternoon --

01:30 20 **THE COURT:** Okay. You can play that.

01:30 21 **MR. BROCK:** -- so we can make use of the time that
01:30 22 way.

01:30 23 **THE COURT:** Okay. Well, I guess considering there's
01:30 24 not much else that makes sense, that's fine. We'll do that.

01:30 25 **MR. BROCK:** All right. Thank you for the

01:30 1 accommodations, Your Honor.

01:30 2 **MS. HIMMELHOCH:** Thank you, Your Honor.

01:30 3 **THE COURT:** Okay. Mr. Cernich.

01:30 4 Let me just say, too, I am expecting a phone
01:30 5 call sometime early or mid-afternoon, and if it comes, I may
01:30 6 have to step off of the bench for just about five minutes and
01:30 7 I'll just let you-all know if I get that message. Okay?

01:30 8 **MR. BROCK:** Yes, Your Honor.

01:31 9 **THE COURT:** All right.

01:31 10 Go ahead.

01:31 11 (WHEREUPON, **MARTIN BLUNT, PH.D.** , having been
01:31 12 previously duly sworn, testified as follows.) .

01:31 13 **CROSS-EXAMINATION**

01:31 14 **BY MR. CERNICH:**

01:31 15 **Q.** Welcome back, Professor Blunt. Scott Cernich for the U.S.
01:31 16 I still have you on cross-examination.

01:31 17 Professor Blunt, in order to calculate the "N" in
01:31 18 your material balance calculation, the original oil in place,
01:31 19 the connected volume -- can we agree on that term?

01:31 20 **A.** Yes.

01:31 21 **Q.** Okay. You need an analysis of the seismic survey in your
01:31 22 analysis; correct?

01:31 23 **A.** Yes. I include the seismic survey in the analysis.

01:31 24 **Q.** And in your analysis you used BP's P50 acreage reservoir
01:31 25 area of 4,482 acres for your analysis; correct?

01:31 1 A. Yes.

01:31 2 Q. And you didn't look at any sensitivities in the size of
01:31 3 that acreage?

01:31 4 A. Yes, I did, in the sense that I looked at BP's documents
01:32 5 concerning this and I looked at their low case and I looked at
01:32 6 their high case, but I didn't -- I didn't carry that forward
01:32 7 for the quantitative calculations, because I thought neither of
01:32 8 them were plausible based on information post-drilling.

01:32 9 And, moreover, the pressure analysis very much
01:32 10 constrained what the connected area was.

01:32 11 Q. I'm talking about the total area of your reservoir. I'm
01:32 12 not talking about the connected area at this point. Let's just
01:32 13 talk about the area -- the total area of the reservoir. Can
01:32 14 you stay with me on that?

01:32 15 A. Yes.

01:32 16 Q. Okay. You used 4,482 acres and didn't vary that, didn't
01:32 17 explore the sensitivities of that to your calculations?

01:32 18 A. That's correct. In the calculations I didn't explore the
01:32 19 sensitivities, but I did look--

01:32 20 **THE COURT:** Pull your microphone a little bit closer
01:32 21 to you, or just down maybe a little bit. Yeah. There you go.

01:32 22 **THE WITNESS:** You are right that I didn't explore the
01:32 23 sensitivities, but I did look at the other seismic
01:33 24 interpretations.

25

01:33 1 BY MR. CERNICH:

01:33 2 Q. And your material balance model is actually highly
01:33 3 sensitive to the seismic area of the reservoir, isn't it?

01:33 4 A. It has an impact on my determination of connected oil,
01:33 5 yes.

01:33 6 Q. Significant impact?

01:33 7 A. Well, I -- I don't want to try and quantify what
01:33 8 "significant" is, but it's -- it's incorporated into my
01:33 9 analysis, yes.

01:33 10 Q. And sitting here today, you don't know what the -- you
01:33 11 can't testify as to what the impact of the seismic area is to
01:33 12 your -- is to your material balance analysis?

01:33 13 A. No, I'm not able to quantify that as I sit here today.

01:33 14 Q. When you originally submitted your report, you relied on a
01:33 15 seismic interpretation by a BP litigation expert; correct?

01:33 16 A. I did incorporate some information from this expert;
01:34 17 however, it didn't have any impact on my quantitative
01:34 18 calculations. My conclusions stay the same.

01:34 19 Q. But you incorporated that -- you did incorporate that
01:34 20 information?

01:34 21 A. Yes. I considered that information, I think, in one of
01:34 22 the appendices to support the use of BP's P50 case.

01:34 23 Q. And you didn't perform your own independent interpretation
01:34 24 of the seismic information for the Macondo reservoir, did you?

01:34 25 A. No. I did not interpret the raw seismic data. That does

01:34 1 not lie within my expertise.

01:34 2 Q. Now, earlier you showed the Judge your model, your rock
01:34 3 with the clay channels laid over it. Do you recall that?

01:34 4 A. Yes.

01:34 5 Q. And -- but according to you, we don't actually know how
01:34 6 the channels were arranged subsurface in the Macondo reservoir,
01:34 7 do we?

01:35 8 A. No.

01:35 9 **THE WITNESS:** Your Honor, the seismic survey has
01:35 10 insufficient resolution to discretely determine individual
01:35 11 channels. What I showed was a possible arrangement of channels
01:35 12 consistent with the data, but there are other possibilities, of
01:35 13 course.

01:35 14 **BY MR. CERNICH:**

01:35 15 Q. And so that's consistent with your report where you write
01:35 16 that the Macondo was so deep that seismic surveys could not
01:35 17 discern individual channels?

01:35 18 A. Indeed, yes.

01:35 19 Q. So when you showed the Judge that -- what, you call that
01:35 20 your geological model?

01:35 21 A. Yes.

01:35 22 Q. You weren't trying to tell Judge Barbier, this is what the
01:35 23 Macondo well -- I mean, the Macondo reservoir actually looks
01:35 24 like, were you?

01:35 25 A. I wasn't -- no, in the sense that I was not trying to

01:35 1 suggest that I know exactly where each channel of sandstone
01:35 2 resides. But, yes, in the sense that I think it's a perfectly
01:35 3 plausible representation of the field consistent with the
01:35 4 geology and the geophysics.

01:35 5 Q. It's actually just a possible structure, isn't it?

01:35 6 A. It's a possible structure that's consistent with all the
01:36 7 information that we have.

01:36 8 Q. And it doesn't provide any actual evidence as to how the
01:36 9 channels in the Macondo reservoir were actually arranged or
10 connected, does it?

01:36 11 A. No. It does not provide a direct quantification of the
01:36 12 connectivity; that comes from pressure analysis. But it
01:36 13 used -- has used that to show that it is perfectly reasonable,
01:36 14 indeed, legitimate to consider limited connectivity.

01:36 15 Q. But, in fact, it only shows how the channels might be
01:36 16 arranged in the subsurface. It's just a possibility?

01:36 17 A. It's -- indeed, it is. It's a possibility, as I've said,
01:36 18 but a possibility that's consistent with all the scientific
01:36 19 evidence.

01:36 20 Q. It's fair to say that you spent many pages in your report
01:36 21 discussing the connectivity of the Macondo reservoir?

01:36 22 A. Yes, it's one of the analyses in my report.

01:36 23 Q. And you used terms like "limited connectivity," "poor
01:36 24 connectivity," "incomplete connectivity," "limited channel
01:37 25 connectivity" about a dozen times in your report?

01:37 1 A. That's possible. It's certainly something that was
01:37 2 legitimate to consider.

01:37 3 Q. But you would agree that the connectivity of the Macondo
01:37 4 reservoir is very strong?

01:37 5 A. Yes, that's quite likely.

01:37 6 **THE WITNESS:** I mean, Your Honor, as I've said, I
01:37 7 tried to look at the maximum plausible connected volume, the
01:37 8 maximum connectivity, and I came up with numbers between 87 and
01:37 9 90 percent of this upper bound. By most geological standards,
01:37 10 that would be considered good connectivity, yes.

01:37 11 **BY MR. CERNICH:**

01:37 12 Q. So that all of that discussion in your report about
01:37 13 limited connectivity, that's really not relevant to your
01:37 14 ultimate analysis because you determined the Macondo reservoir
01:37 15 had strong connectivity?

01:37 16 A. It's relevant in the sense that it's certainly legitimate
01:37 17 to consider it and to consider it seriously. And the
01:37 18 connectivity isn't 100 percent, so it does, of course, impact
01:37 19 my calculations.

01:37 20 Q. It's about 89, 90 percent?

01:37 21 A. Yeah. That's -- I would consider that the maximum
01:37 22 plausible connectivity, based on BP's P50 seismic
01:38 23 interpretation.

01:38 24 Q. And long before BP retained you as a litigation expert in
01:38 25 this case, BP actually determined that the oil sand

01:38 1 connectivity for the Macondo reservoir was obviously
01:38 2 demonstrated to be very strong, didn't they?

01:38 3 A. I've seen, I think it's an e-mail, where that comment is
01:38 4 made and I think, as I've said in deposition, I don't
01:38 5 understand the "obviously." But my interpretation of that is
01:38 6 that the sandstone channels are well connected along their
01:38 7 length, which is, indeed, consistent with my interpretation,
01:38 8 but don't necessarily have an inference about how discrete
01:38 9 channels might be connected to each other.

01:38 10 So it's -- I would consider that perfectly consistent
01:38 11 with my analysis.

01:38 12 MR. CERNICH: Can we go to Exhibit 9278, please.

01:38 13 BY MR. CERNICH:

01:38 14 Q. Professor Blunt, is this the e-mail to which you refer?

01:39 15 A. I'm not sure, actually, because it doesn't mention
01:39 16 connectivity in the --

01:39 17 Q. Well, this is the first e-mail in the string. We'll move
01:39 18 on here. And this is an e-mail -- Bryan Ritchie there, you've
01:39 19 see Mr. Ritchie. You read his deposition, and he was one of
01:39 20 the BP geophysicists that you relied on in your -- in
01:39 21 performing your analysis?

01:39 22 A. My understanding is that it was -- Bryan Ritchie was one
01:39 23 of the geophysicists who provided the seismic interpretation.

01:39 24 MR. CERNICH: If we could move up through this
01:39 25 e-mail, please, Don.

1 The next -- the previous page. There we go.

2 **BY MR. CERNICH:**

3 Q. This is an e-mail from Sean Cavalero dated July 16th, 2010
4 to a number of individuals, including Mr. Ritchie, "Subject:
5 GoM" -- that's Gulf of Mexico -- "aquifer sizes." Is that
6 correct?

7 A. Yes.

8 Q. And Mr. Cavalero, you see, is the Gulf of Mexico resource
9 discipline lead, reservoir engineering; correct?

10 A. Yes, I can see that.

11 Q. And he writes: "The Macondo sand deposition is very
12 channel shaped, with aquifer sand connecting in a longish
13 ribbon off only two sides. Oil sand connectivity has obviously
14 been demonstrated to be very strong."

15 Did I read that correctly?

16 A. Yes.

17 Q. And you broadly agree with Mr. Cavalero?

18 A. I would say, broadly speaking, that is consistent with the
19 geological model that I presented earlier.

20 Q. And Mr. Cavalero, BP's resource discipline lead for the
21 Gulf of Mexico, also notes that there is aquifer sand
22 connecting in a longish ribbon off -- off two opposite sides of
23 the Macondo reservoir; correct?

24 A. Yes, I can see that.

25 Q. And that's what BP said then, and you disagree with that

01:40 1 now?

01:40 2 A. I don't necessarily disagree with it. What it means in my
01:41 3 geological model is that there's good connectivity in the
01:41 4 oil-bearing sandstone; and then you have this dome-shaped
01:41 5 structure, and as you go further along, that sandstone is
01:41 6 saturated with water. That's what an aquifer means.

01:41 7 But -- here's the but -- at the time that e-mail was
01:41 8 written, all the pressure data was not available. When you
01:41 9 look at the pressure data out to August the 3rd, as I've
01:41 10 already described, you see clear and uncontrovertible evidence
01:41 11 that there are barriers to flow on all sides of the reservoir.

01:41 12 So the aquifer is not connected in the sense that it
01:41 13 is not providing pressure support for the period of the Macondo
01:41 14 spill.

01:41 15 Q. Professor Blunt, you would agree that best practice
01:41 16 requires the reservoir engineer to check his model against
01:41 17 measurements and analyses from other disciplines, such as
01:41 18 geology?

01:41 19 A. Yes, broadly speaking, that's correct.

01:41 20 Q. That's a direct quote from your report, isn't it?

01:42 21 A. I wasn't aware that it was, but I don't disagree with it.

01:42 22 Q. And you criticize the government experts because they
01:42 23 omitted the important process of geological verification; isn't
01:42 24 that correct?

01:42 25 A. Yes.

01:42 1 Q. Did you check your model against the seismic analysis,
01:42 2 Professor Blunt?

01:42 3 A. Well, I did in the sense that I have compared my
01:42 4 geological analysis side by side with the seismic
01:42 5 interpretation that's in my expert report. And I've also
01:42 6 compared the connected area against the seismic, as was in my
01:42 7 testimony this morning.

01:42 8 Q. And isn't it true that your model is inconsistent with the
01:42 9 seismic and geological information?

01:42 10 A. No, I would not say that.

01:42 11 Q. Now, the reservoir thickness encountered at the well was
01:42 12 93 feet?

01:42 13 A. That's correct.

01:42 14 Q. And, in your opinion, it's evident from the seismic
01:42 15 interpretation that the area away from the well is lower than
01:42 16 93 feet?

01:42 17 A. No. The thickness away from the well is, yes.

01:43 18 Q. The thickness. I'm sorry, I misspoke.

01:43 19 MR. CERNICH: Could we go to page 109 of
01:43 20 Professor Blunt's report.

01:43 21 BY MR. CERNICH:

01:43 22 Q. This section is D.1.6, "Finding the connectivity"?

01:43 23 A. Yes.

01:43 24 Q. And this is the section where you discuss the fact that
01:43 25 the -- it's evident from the seismic interpretation that the

01:43 1 area away from the well is lower than 93 feet?

01:43 2 A. Yes.

01:43 3 Q. And you'd also agree that the reservoir is longer, wider,
01:43 4 and on average less thick than the total height of sandstone
01:43 5 encountered at the well?

01:43 6 A. That's my, I want to say, interpretation of the seismic
01:43 7 interpretation.

01:43 8 Q. And you also criticize -- well, let me move on.

01:43 9 Now, you calculated a reservoir thickness with your
01:43 10 connectivity equations on page 109 of your report.

01:43 11 **MR. CERNICH:** Could we go back to page 109 of the
01:43 12 report, Don.

01:44 13 Could we go move down the page and blow up those
01:44 14 tables, please.

01:44 15 **BY MR. CERNICH:**

01:44 16 Q. This table at the bottom shows the thickness you
01:44 17 calculated; is that right?

01:44 18 A. That's correct.

01:44 19 Q. Okay. That's using Professor Gringarten's gold standard
01:44 20 P10 MDT permeability number; is that right?

01:44 21 A. That's correct.

01:44 22 Q. Now, I'd like to take a look -- oh, I'm sorry. And in the
01:44 23 redacted section of your report there, you said that the
01:44 24 average -- the seismic analysis said that the average thickness
01:44 25 was about 70 feet; isn't that right?

01:44 1 **MR. BROCK:** Your Honor, if we're going to talk about
01:44 2 the redacted report, we'll put it back in. So I don't know how
01:44 3 we can have one that's redacted.

01:44 4 **THE COURT:** All right.

01:44 5 **MR. BROCK:** If we're going to redact it, let's --
01:45 6 we'll put the whole thing in.

01:45 7 **THE COURT:** I understand. I understand your point.

01:45 8 **MR. CERNICH:** Your Honor, the rule, as I understand
01:45 9 it, that was in effect from Phase One still exists, that if a
01:45 10 party voluntarily redacts something from their report, they're
01:45 11 still open to cross-examination on the portions that they
01:45 12 voluntarily redact from their reports.

01:45 13 **MR. BROCK:** This is not a voluntary redaction. This
01:45 14 relates, as I understand it, to the organization of experts for
01:45 15 trial.

01:45 16 **MR. CERNICH:** It does not, Your Honor. He was -- I'm
01:45 17 sorry, I don't want to speak over you.

01:45 18 **THE COURT:** I'm not sure where you're going with the
01:45 19 question. Is this something that you think impeaches or
01:45 20 contradicts something he said here in court?

01:45 21 **MR. CERNICH:** Yes, Your Honor. I think this
01:45 22 undermines his analysis.

01:45 23 **THE COURT:** Well, in terms of cross-examination,
01:45 24 there's obviously a broader scope for cross-examination for
01:45 25 what's relevant or what can be used and what can be used by the

01:45 1 offering party. So I haven't heard exactly where this is going
01:46 2 yet, but it sounds like it fits that groove. So go ahead,
01:46 3 Mr. Cernich. I'll overrule the objection.

01:46 4 **MR. CERNICH:** Thank you, Your Honor. I'm going to
01:46 5 move to that place right now.

01:46 6 Could we have -- I'd like to get our
01:46 7 demonstrative --

01:46 8 (Discussion off the record.)

01:46 9 **MR. CERNICH:** Your Honor, may we -- we have a
01:46 10 demonstrative that I'd like to put on the easel.

01:46 11 **THE COURT:** Okay.

01:46 12 **MR. CERNICH:** Judge, we're going to put up what's
01:46 13 Exhibit TREX-130547.

01:46 14 **BY MR. CERNICH:**

01:46 15 **Q.** Professor Blunt, you're familiar with this document,
01:46 16 correct --

01:46 17 **A.** I'm sorry, some --

01:46 18 **Q.** -- that's up on the -- yeah. You know, I'm sorry.

01:46 19 **THE COURT:** Which one?

01:46 20 **MR. CERNICH:** Oh.

01:46 21 **BY MR. CERNICH:**

01:46 22 **Q.** The one that's up on the screen over here.

01:46 23 **A.** That looks like the first tab of my spreadsheet --

01:47 24 **Q.** Yes, which you call your --

01:47 25 **A.** -- that I used to --

01:47 1 Q. -- master material balance spreadsheet?

01:47 2 A. Indeed. It was the spreadsheet in which I performed a
01:47 3 number of my calculations.

01:47 4 Q. And it was produced with your expert report to the parties
01:47 5 in this case?

01:47 6 A. It was, yes.

01:47 7 Q. And at the top there, it says: "Key data used in this
01:47 8 analysis using references and methodologies described in the
01:47 9 'Modeling Macondo' report."

01:47 10 Did I read that correctly?

01:47 11 A. Yes.

01:47 12 Q. And then over on the left there it says: "This sheet
01:47 13 gives the main overview results from the material balance and
01:47 14 where most of the key parameters are input."

01:47 15 A. Yes, that's correct.

01:47 16 Q. All right. And then if we could move over the spreadsheet
01:47 17 a little bit and look at your parameters as well as your totals
01:47 18 there.

01:47 19 MR. CERNICH: If we can slide over -- slide the
01:47 20 spreadsheet over a bit. A little bit more. Okay.

01:47 21 BY MR. CERNICH:

01:47 22 Q. And there's your number, your best estimate, the 3.26 over
01:47 23 on the right there under "Average"; is that right?

01:47 24 A. Yes, that -- that does --

01:47 25 Q. Okay. And then here we have the inputs to your report --

01:48 1 I mean, the inputs to your analysis?

01:48 2 A. Yes.

01:48 3 Q. And right here we have the pore volume compressibilities
01:48 4 that you got from Professor Zimmerman, 8.7, 6.35, and 4.34?

01:48 5 A. Indeed, that's the range of rock compressibility that I
01:48 6 considered --

01:48 7 Q. Okay. And there's --

01:48 8 A. -- in my calculations.

01:48 9 Q. -- 4,482, that's the acreage, the area of the -- from the
01:48 10 seismic that you used?

01:48 11 A. Yes, from BP's seismic.

01:48 12 Q. And the average reservoir height you used, 44 feet?

01:48 13 A. Yes. Again, I took that from BP's seismic interpretation.

01:48 14 Q. And let's move down just a little bit there and you see:
01:48 15 "Height of the reservoir sandstone encountered."

01:48 16 That's your height at the well, 93 feet?

01:48 17 A. That's correct.

01:48 18 Q. Okay. And then if we go to upper bound permeability,
01:48 19 that's 329 millidarcys, and that's Professor Gringarten's P10
01:49 20 permeability, isn't it?

01:49 21 A. That's correct.

01:49 22 **MR. CERNICH:** If we could go to the parameter
01:49 23 estimates tab on the spreadsheet.

01:49 24 **BY MR. CERNICH:**

01:49 25 Q. And there over on the left -- I'm looking at Columns C

01:49 1 through F -- we have the connectivity and the thickness
01:49 2 numbers, the same ones that appear on -- that appear in your
01:49 3 report, on page 109 of your report, that we were looking at a
01:49 4 moment ago?

01:49 5 A. I assume that they are the same even without checking,
01:49 6 because that's -- that's where I got those numbers from.

01:49 7 Q. Okay. Would you like a copy of your report to --

01:49 8 A. No --

01:49 9 Q. -- confirm that?

01:49 10 A. -- no, I have a copy. I'm not disputing that you're
01:49 11 right.

01:49 12 Q. Okay.

01:49 13 MR. CERNICH: And if we can go back over to --

01:49 14 BY MR. CERNICH:

01:49 15 Q. And those are your connectivity numbers as well, just
01:49 16 above -- okay. This is fine. We're back on the material
01:49 17 balance.

01:49 18 So let's -- you said earlier that you thought that --
01:49 19 and there were demonstratives that counsel showed you on direct
01:49 20 that show that your -- that you think the gold standard for
01:49 21 permeability is the 238 millidarcys that was calculated by
01:50 22 Professor Gringarten; isn't that right?

01:50 23 A. I would consider that, from Professor Gringarten's expert
01:50 24 report, the most likely value of permeability, yes.

01:50 25 Q. Most likely. And that's the one you -- and you say that

01:50 1 in your expert report and that's what you rely on?

01:50 2 **MR. BROCK:** I object to that. He used the -- he used
01:50 3 the higher number. He used the 335, not the --

01:50 4 **MR. CERNICH:** In his report, Your Honor,
01:50 5 Professor Blunt says that he thought that 238 millidarcys was
01:50 6 the correct number, but 329 millidarcys what he was -- was what
01:50 7 he was using to be conservative.

01:50 8 **MR. BROCK:** Correct.

01:50 9 **THE WITNESS:** That's correct, Mr. Cernich.

01:50 10 **BY MR. CERNICH:**

01:50 11 **Q.** Now, isn't it true, Professor Blunt, that when you used
01:50 12 Professor Gringarten's 238 millidarcys, what you called the
01:50 13 most likely value, that it does not agree -- your model does
01:50 14 not agree with the geological and seismic information that
01:50 15 you've analyzed?

01:51 16 **A.** No. That's -- I wouldn't say that that was the case, and
01:51 17 I have explored -- I just want to say, in playing with the
01:51 18 spreadsheet, I've explored putting in different parameters and
01:51 19 the consequences of that and I would consider using 238 is also
01:51 20 a perfectly plausible number to use.

01:51 21 **Q.** Okay. Well, let's see what happens when we use 238.

01:51 22 **MR. CERNICH:** Can we change the upper bound
01:51 23 permeability to 238, please?

01:51 24 **BY MR. CERNICH:**

01:51 25 **Q.** And just before we move on, decreasing that permeability

01:51 1 down to 238 only makes about -- less than a 10 percent
01:51 2 difference in your cumulative oil released; isn't that true?

01:51 3 A. That's correct. In my analysis my number is not
01:51 4 particularly sensitive to the permeability value.

01:51 5 MR. CERNICH: If we could go to the parameter
01:51 6 estimates tab.

01:51 7 BY MR. CERNICH:

01:51 8 Q. Now, let's look at what that did to your thickness,
01:52 9 Professor Blunt. Now your thickness averages over -- about
01:52 10 104 feet; isn't that correct?

01:52 11 A. That's the number in the spreadsheet. That is not a
01:52 12 correct determination.

01:52 13 Q. So the number in your spreadsheet, the spreadsheet that
01:52 14 you produced with your expert report to the parties in this
01:52 15 case, is incorrect?

01:52 16 A. No. You've put an incorrect input into the material
01:52 17 balance. If you -- if you look at the input in the first tab
01:52 18 that you've just changed, it's called the upper bound
01:52 19 permeability. The upper bound permeability is not
01:52 20 238 millidarcys.

01:52 21 Q. Okay. And how does that change your spreadsheet?

01:52 22 A. Well, the input into the spreadsheet is the upper bound
01:52 23 permeability, not the most likely.

01:52 24 Q. So your whole analysis changes if we use what is -- you
01:52 25 call the best -- the best value, the most likely value of

01:52 1 permeability?

01:52 2 A. Well, the spreadsheet input is the upper bound
01:52 3 permeability. You can't put a permeability value in that tab
01:53 4 that is not the upper bound, and that's how the spreadsheet was
01:53 5 constructed.

01:53 6 If you, say, do an analysis with a permeability of
01:53 7 238 millidarcys -- now, I can't remember, Your Honor,
01:53 8 explicitly doing this, but I have played with numbers on the
01:53 9 spreadsheet -- of course, you've just revealed something that
01:53 10 is clearly not correct. You can't have a reservoir thickness
01:53 11 on average that is greater than encountered at the well.

01:53 12 So you have to truncate the equation so the thickness
01:53 13 is no more than 93 feet. I didn't put that in the spreadsheet
01:53 14 because that isn't one of the calculations presented in my
01:53 15 expert report, and the tab quite clearly says "upper bound
01:53 16 permeability."

01:53 17 Q. And that's your explanation here in court today, that your
01:53 18 spreadsheet -- if I change your permeability, it invalidates
01:53 19 your entire analysis, everything that's in this spreadsheet?

01:53 20 MR. BROCK: Objection, Your Honor. That's not what
01:54 21 he testified to.

01:54 22 THE COURT: All right. Well, he can expound. I
01:54 23 overrule the objection.

01:54 24 THE WITNESS: Yes. Let me explain, Mr. Cernich. As
01:54 25 I've said, I've played with the spreadsheet. I'm fully aware

01:54 1 of the fact that you can -- you can get, I want to say,
01:54 2 exaggerated thicknesses. Between submitting my expert report
01:54 3 and now, I've slightly modified the spreadsheet, mainly for my
01:54 4 own analysis --

01:54 5 **MR. CERNICH:** Your Honor, I'm going to move to strike
01:54 6 any new opinions.

01:54 7 **THE WITNESS:** It's not --

01:54 8 **MR. CERNICH:** We had a spreadsheet, we had a report,
01:54 9 and now Professor Blunt's saying he's changed his model and his
01:54 10 analysis since submitting this. I don't think that that's fair
01:54 11 for him to testify to new opinions here in court today.

01:54 12 **THE COURT:** Is that what you're doing?

01:54 13 **THE WITNESS:** It's not a new opinion, Your Honor.
01:54 14 I'm simply trying to explain -- you know, Mr. Cernich has put
01:54 15 in a value into my spreadsheet that says very clearly "upper
01:54 16 bound permeability." Instead he's put in a most likely
01:54 17 valuable.

01:54 18 But he is reasonably asking, if you put in the
01:55 19 most likely valuable, what happens to my connectivity analysis?
01:55 20 And it's absolutely true that clearly you can't come up with a
01:55 21 thickness that's more than 93 feet. And I have, and it's true,
01:55 22 subsequent to submitting my expert report, I've simply put in a
01:55 23 truncation that makes the average thickness no more than
01:55 24 93 feet.

01:55 25 And then you get -- and I've checked it, and

01:55 1 it's not a new opinion -- you get perfectly geologically
01:55 2 plausible representation of the reservoir.

01:55 3 But that's not what I did in my expert report,
01:55 4 and I'm not pretending that I did that in my expert report, and
01:55 5 I stand by what is in my report.

01:55 6 **BY MR. CERNICH:**

01:55 7 **Q.** And you didn't share that analysis with the United States
01:55 8 or any of the other parties in this case?

01:55 9 **A.** Because it was not in my expert report and it was not part
10 of the formation of my opinions.

01:55 11 **Q.** Okay. Before we move on -- before we move on,
01:55 12 Professor Blunt, we talked about the effect of area on your
01:56 13 analysis, the seismic area.

01:56 14 **MR. CERNICH:** If we could go back to what
15 Professor Blunt calls his upper bound permeability there.

01:56 16 **BY MR. CERNICH:**

01:56 17 **Q.** And now we're back at the 3.26; correct?

01:56 18 **A.** Yes.

01:56 19 **Q.** Okay. And I just wanted to look at the reservoir area,
20 which you didn't explore the sensitivities on; correct?

01:56 21 **A.** I didn't explore the sensitivities on the spreadsheet, but
22 I did explore sensitivities using Professor Torres-Verdin's
23 seismic interpretation.

01:56 24 **Q.** Okay. I just wanted to take a look at the sensitivity of
25 that.

01:56 1 So you recall that the -- that BP's max reservoir
01:56 2 area in their predrill was, I think, 8692 or something about
01:56 3 that? Do you recall that?

01:56 4 A. I don't recall the exact number, but I don't doubt that
01:56 5 that seems reasonable.

01:57 6 Q. Well, let's just try a number in between that. And we're
01:57 7 putting in 6,580. And that increases your total amount of oil
01:57 8 released about 1 point -- a little over 1.3 million barrels?

01:57 9 A. I can see that.

01:57 10 Q. And you didn't explore that sensitivity in your analysis?

01:57 11 A. Not in the analysis that was prepared in my expert report,
01:57 12 but I can comment on the results of that calculation.

01:57 13 Q. I'd like to talk now about -- let's talk about rock
01:57 14 compressibility, Professor Blunt.

01:57 15 A. Okay.

01:57 16 Q. Now, we've established that the pore volume
01:57 17 compressibilities you used in your quantitative calculations
01:57 18 are taken directly from the expert report of
01:58 19 Professor Zimmerman?

01:58 20 A. Yes. Those are the numbers from Professor Zimmerman's
01:58 21 expert report, although, as I've said, I do perform my own
01:58 22 analysis.

01:58 23 Q. And if his calculations are incorrect, then that would
01:58 24 mean that your material balance calculation would also be
01:58 25 incorrect?

01:58 1 A. I have no reason to believe the numbers are incorrect
01:58 2 because I performed my own careful review of the data.

01:58 3 Q. Okay. Well, we'll take that up with Professor Zimmerman.

01:58 4 Now, even though you rely on Professor Zimmerman, you
01:58 5 spend several pages in your report conducting your own
01:58 6 analysis; isn't that right?

01:58 7 A. That's correct.

01:58 8 Q. Now, on -- and you calculate your own UPVC?

01:58 9 A. Yes, I do.

01:58 10 Q. You, yourself, Dr. Blunt, you've never performed rock
01:58 11 mechanics testing?

01:58 12 A. I haven't personally performed rock mechanics testing, but
01:58 13 I've used rock mechanics results in my reservoir engineering
01:58 14 calculations routinely.

01:59 15 Q. And you -- in fact, you've never provided a client with an
01:59 16 opinion as to the pore volume compressibility of a reservoir
01:59 17 based on your analysis of rotary sidewall cores, have you?

01:59 18 A. No, I have not. But the startup company that I mentioned
01:59 19 this morning, iRock Technologies, does make predictions of
01:59 20 related elastic properties on rotary sidewall cores.

01:59 21 Q. But you're here testifying today, Professor Blunt,
01:59 22 correct, not your company, not iRock Technologies?

01:59 23 A. Well, I'm involved in the work that they do; but you're
01:59 24 right, I haven't personally given an opinion to a client before
01:59 25 this on pore volume compressibility measured on a rotary

01:59 1 sidewall core.

01:59 2 Q. On direct you testified about your familiarity with
01:59 3 Weatherford's work and your review of Weatherford's protocols;
02:00 4 isn't that correct?

02:00 5 A. Yes.

02:00 6 Q. You don't know what the proper protocol for cleaning
02:00 7 sidewall cores for UPVC testing is, do you?

02:00 8 A. As I sit here, I don't recall all the details.

02:00 9 Q. Okay. And you also didn't know that at your deposition?

02:00 10 A. As I said, I don't recall all the details.

02:00 11 Q. And you didn't know that when you authored your expert
02:00 12 report either?

02:00 13 A. I do not comment on the cleaning protocols in my expert
02:00 14 report, no.

02:00 15 Q. And you didn't know what they were when you wrote your
02:00 16 expert report?

02:00 17 A. As I sit here, I can't recall. I did read the Weatherford
02:00 18 report and all their testing procedures. If that was in my
02:00 19 mind at the time I was writing the report, it was. But as I
02:00 20 said, I can't recall it now, and I couldn't recall it in my
02:00 21 deposition.

02:00 22 MR. CERNICH: Could we go to the deposition of
02:00 23 Professor Blunt, page 332. We're going to lines 9 through 13.

02:01 24 BY MR. CERNICH:

02:01 25 Q. (Reading.)

02:01 1 "QUESTION: Do you know what the proper protocol is
02:01 2 for cleaning rotary sidewall cores to be used for UPVC
02:01 3 testing?

02:01 4 "ANSWER: I don't personally, but I have no reason to
02:01 5 doubt Weatherford's competence in this area."

02:01 6 Is that the question you were asked and the answer
02:01 7 you gave at your deposition?

02:01 8 **MR. BROCK:** I would just object to that as not proper
02:01 9 impeachment. I think he has already described this very
02:01 10 answer.

02:01 11 **MR. CERNICH:** Your Honor, respectfully,
02:01 12 Professor Blunt has said numerous times, "I don't recall. I
02:01 13 don't recall." During his deposition, there wasn't any -- any
02:01 14 ambiguity about whether he recalled. He said he did not know
02:01 15 the proper protocol --

02:01 16 **THE COURT:** All right. Overrule the objection.
02:01 17 Did you answer his question?

02:01 18 **THE WITNESS:** I'm sorry. What was the question?

02:01 19 **BY MR. CERNICH:**

02:01 20 **Q.** I asked: Did I -- is that the question you were asked at
02:01 21 your deposition and is that the answer you gave?

02:02 22 **A.** That's the answer I gave, and I'm happy to give that
02:02 23 answer again now. I don't personally know. I can't recall
02:02 24 what the protocols were for Weatherford. But as you've said, I
02:02 25 use Weatherford labs myself, and I have no reason to doubt

02:02 1 their competence in the area.

02:02 2 **MR. CERNICH:** Could we go to Exhibit 11527.0061.

02:02 3 **BY MR. CERNICH:**

02:02 4 **Q.** This is your report, Professor Blunt. We're going to go
02:02 5 to -- let's see. We're on page 61. This section of your
02:02 6 report discusses pore volume compressibility calculations; is
02:02 7 that right?

02:02 8 **A.** Yes, yes. I'm just having difficulty reading it, that's
02:02 9 all.

02:02 10 **Q.** Sure. And if we could look at the top of the page here.
02:02 11 And you write here: "There are correlations in the literature
02:02 12 to predict pore volume compressibility from porosity for
02:03 13 sandstones. For instance, the Hall (1953)" --

02:03 14 That refers to a paper by Dr. Hall?

02:03 15 **A.** Yes.

02:03 16 **Q.** -- "correlation can be used to calculate compressibility
02:03 17 from porosity. For Macondo, this gives a value of 3.5
02:03 18 microsips."

02:03 19 Did I read that correctly?

02:03 20 **A.** Yes.

02:03 21 **Q.** You're aware, of course, that BP's rock mechanics expert,
02:03 22 Professor Zimmerman, does not agree with you that the Hall
02:03 23 correlations can be used to calculate compressibility from
02:03 24 porosity for the Macondo reservoir?

02:03 25 **A.** That's not my understanding. Obviously, the Hall

02:03 1 correlation can be used because it's an equation; you put in a
02:03 2 porosity and you get out a compressibility.

02:03 3 What Professor Zimmerman was saying, quite rightly,
02:03 4 was that you wouldn't use the Hall correlation for quantitative
02:03 5 determination of pore volume compressibility; and I agree with
02:03 6 him on that, I didn't either.

02:04 7 Q. But you reported a quantitative determination in your
02:04 8 report, didn't you?

02:04 9 A. Yes, but I didn't use that number. It was simply to see:
02:04 10 Is the number that was measured for pore volume compressibility
02:04 11 in Macondo, is it a bit of an outlier? Is it far too low? Is
02:04 12 there any evidence that it should be a great deal higher?

02:04 13 This piece of evidence doesn't support that. But,
02:04 14 no, I didn't use 3.5 in my analysis. And I agree with
02:04 15 Professor Zimmerman, it's a rough correlation; and, obviously,
02:04 16 it's not nearly as reliable as relying on the measured data.

02:04 17 Q. Okay. So you didn't rely on -- you didn't use your own
02:04 18 PVC number for your analysis that calculates your total
02:04 19 cumulative volume of oil spilled, and you also didn't use this
02:04 20 calculation that you made using the Hall correlation for any of
02:04 21 your quantitative calculations?

02:04 22 A. Well, let's put it this way: Of course I did not use the
02:04 23 Hall correlation; I was using it to see, as I said, whether or
02:05 24 not the measured data was an outlier.

02:05 25 I, from my own analysis, determined a slightly lower

02:05 1 value of pore volume compressibility than Professor Zimmerman,
02:05 2 but for good scientific reasons, I deferred to his superior
02:05 3 expertise and used his slightly higher values in my
02:05 4 calculations.

02:05 5 Q. Really briefly, let's talk about the 12-microsip number.

02:05 6 You criticized some U.S. experts for using a value of
02:05 7 12 microsips; is that correct?

02:05 8 A. Yes.

02:05 9 Q. But you're aware, and I believe you discussed on direct,
02:05 10 that BP used a pore volume compressibility number of
02:05 11 12 microsips for its reservoir modeling related to shutting in
02:05 12 the Macondo well in July of 2010?

02:05 13 A. Yes. I'm aware that BP used a value of 12 microsips for
02:05 14 some of its reservoir modeling in that period.

02:05 15 Q. And that was when they were trying to ensure that they
02:05 16 could shut in the well and leave the well shut in safely?

02:05 17 A. Exactly, as a -- as one would say, as a safety case.

02:05 18 Q. And BP presented those modeling results using 12 microsips
02:05 19 to the U.S. Government; correct?

02:06 20 A. That's my understanding.

02:06 21 Q. Now, you write in your report, "There is no scientific
02:06 22 evidence or analysis for this value of 12 microsips," don't
02:06 23 you?

02:06 24 A. Yes.

02:06 25 Q. So in July of 2010, when BP was trying to shut in the

02:06 1 Macondo well, BP's reservoir engineers were using a rock
02:06 2 compressibility based on no scientific evidence or analysis?

02:06 3 A. Yes.

02:06 4 I would say that there is no scientific evidence or
02:06 5 analysis that would support 12 microsips. But any reservoir
02:06 6 engineer does admit that there could be a wide range of
02:06 7 uncertainty; and as part of evaluating a safety case, I
02:06 8 consider it perfectly legitimate to have looked at higher
02:06 9 numbers that, one might say, go outside the measured range
02:06 10 where there isn't, one might say, a scientific determination.

02:06 11 Now that more data is available, specifically the
02:06 12 pressure data, and looking at the field scale consistency
02:07 13 check -- a check, you know, that works when you use reasonable
02:07 14 values -- it's quite clear that 12 really isn't very plausible
02:07 15 for Macondo.

02:07 16 Q. Field scale, you didn't do anything to upgrade these
02:07 17 sidewall core determinations for the field, did you?

02:07 18 A. No. I used -- as I said, the principal source of my
02:07 19 determination of pore volume compressibility was what was
02:07 20 measured.

02:07 21 Q. Now, Professor Blunt, during your direct examination, you
02:07 22 were asked questions and there was a demonstrative related to a
02:07 23 paper from -- that included as its authors Bin Liu and
02:07 24 Professor Kelkar; is that right?

02:08 25 A. Yes.

02:08 1 MR. CERNICH: Could we go to Exhibit 11560.

02:08 2 BY MR. CERNICH:

02:08 3 Q. Is this that paper, Professor Blunt?

02:08 4 A. Yes, it is.

02:08 5 Q. And you testified earlier, I believe, that the Macondo
02:08 6 reservoir is about 13 million years old?

02:08 7 A. Yes, that's my understanding.

02:08 8 Q. Okay. And you're aware that the Lower Tertiary reservoirs
02:08 9 are over 30 million years old; is that right?

02:08 10 A. Yes, some of them are. If I refer to the title of the
02:08 11 paper and they're looking at Middle Miocene to Paleocene
02:08 12 reservoirs. The Middle Miocene is about the age of Macondo;
02:08 13 two reservoirs, I'll admit, that are even older.

02:08 14 Q. But the Macondo is not a Lower Tertiary reservoir?

02:08 15 A. Well, I'm -- what I'm relying on here is the title of the
02:09 16 paper.

02:09 17 Q. It's a simple question, Professor Blunt. You said the
02:09 18 Macondo reservoir is 13 million years old. You agree that the
02:09 19 Tertiary reservoirs are over 30 million years old. Are you
02:09 20 with me?

02:09 21 A. No. I said that some of the Tertiary reservoirs could be
02:09 22 30 million years old, I think. I mean, I don't have the
02:09 23 numbers in my head.

02:09 24 Q. But the Macondo is not a Lower Tertiary reservoir.

02:09 25 A. It depends how you define "Lower Tertiary." I'm afraid I

02:09 1 don't quite understand the question. It's certainly applicable
02:09 2 to this paper, because I do know that Macondo is defined
02:09 3 geologically as Middle Miocene, and that's there in the title
02:09 4 of the paper.

02:09 5 **MR. CERNICH:** Could we go to page 6 of the paper,
02:09 6 please.

02:09 7 **BY MR. CERNICH:**

02:09 8 **Q.** You reviewed this entire paper, didn't you,
02:09 9 Professor Blunt?

02:09 10 **A.** I've read the whole paper, yes.

02:09 11 **Q.** You read every word in the paper?

02:09 12 **A.** Yes, but I can't recall every word as I sit here today.

02:09 13 **Q.** Well, do you recall that this paper says: "The Lower
02:10 14 Tertiary reservoirs in the GoM like Tahiti are typically well
02:10 15 consolidated due to the reservoir age and depth and exhibit
02:10 16 much lower rock compressibility and permeability reduction. In
02:10 17 this study, the rock compressibility is assumed to be 1 to 10
02:10 18 microsips."

02:10 19 Did I read that correctly?

02:10 20 **A.** Yes.

02:10 21 **Q.** And that's the range that you cite in your report, that 1
02:10 22 to 10 microsips, that you take away from this article?

02:10 23 **A.** Yes.

02:10 24 **Q.** And this article says that applies to Lower Tertiary
02:10 25 reservoirs?

02:10 1 A. There may be an inference from reading this, but it's not
02:10 2 entirely clear, and I'll simply refer back to the title. The
02:10 3 title makes it clear that Middle Miocene reservoirs, such as
02:10 4 Macondo, are included in the study. And if you look at the
02:10 5 detail table of the reservoirs that were analyzed, there were
02:10 6 reservoirs with characteristics in terms of depth and porosity
02:11 7 that are representative of Macondo.

02:11 8 **MR. CERNICH:** Your Honor, I'm going to move to strike
02:11 9 that responsive as nonresponsive. I simply asked
02:11 10 Professor Blunt whether this article that he relies on says
02:11 11 what it says, that sentence beginning, "Lower Tertiary
02:11 12 reservoirs...."

02:11 13 **THE COURT:** Well, you're asking him whether you read
02:11 14 it right, was that your question?

02:11 15 **THE WITNESS:** Yes, it does say that.

02:11 16 **THE COURT:** Okay. Then he went on to, I guess,
02:11 17 expand on that answer, but okay.

02:11 18 **MR. CERNICH:** Could we go to page 2 of this article?
02:11 19 And if we could go down to "Data Collection."

02:11 20 **BY MR. CERNICH:**

02:11 21 **Q.** And that first sentence there says: "This study
02:11 22 concentrates on the Lower Tertiary, i.e. Late Miocene to
02:12 23 Paleocene reservoirs which were found in the Mississippi
02:12 24 Canyon, Green Canyon, Atwater, Walker Ridge, and Alaminos
02:12 25 Canyon."

02:12 1 Did I read that correctly?

02:12 2 A. Yes.

02:12 3 Q. And the Macondo reservoir is Middle Miocene, isn't it?

02:12 4 A. Yes. So it's included in that categorization.

02:12 5 Could I -- I could explain why. It seems a bit
02:12 6 confusing.

02:12 7 "Late" refers to geological time, Your Honor. So
02:12 8 "Late Miocene" is actually going to be above the Mid-Miocene
02:12 9 and then going down to the Paleocene. So --

02:12 10 **THE COURT:** So it's more recent in time?

02:12 11 **THE WITNESS:** Yes. Yes, more recent in time. So
02:12 12 what we're looking at here is, in fact, that range, Late
02:12 13 Miocene to Paleocene includes Macondo in terms of geological
02:12 14 age.

02:12 15 **MR. CERNICH:** Don, could we go back to the other page
02:12 16 real quickly. That was page 6, up at the top, please.

02:13 17 I'll move on.

02:13 18 **BY MR. CERNICH:**

02:13 19 Q. Professor Blunt, I'd like to talk about permeability
02:13 20 briefly. We've already talked about your own calculation where
02:13 21 you assumed a flow rate. I'd like to talk about the MDT just
02:13 22 briefly here. You didn't perform an MDT analysis, did you?

02:13 23 A. No.

02:13 24 Q. And you don't have any experience interpreting MDT tests?

02:13 25 A. I have not interpreted an MDT test in the past, but the

02:13 1 methodologies to interpret an MDT test are, one would say,
02:14 2 standard well test methodologies.

02:14 3 Q. And you don't have any independent basis to determine or
02:14 4 calculate the permeability of the Macondo reservoir from the
02:14 5 MDT analysis, and you didn't perform such an analysis?

02:14 6 A. No. I did not perform an MDT analysis, and so you're
02:14 7 right to imply that I'm relying on the expert analysis of
02:14 8 Professor Gringarten for that.

02:14 9 Q. And you discussed during your direct exam that this MDT
02:14 10 data was collected on April 12th, 2010. Do you recall that?

02:14 11 A. Yes, sir. That's my understanding. I can't, as I said,
02:14 12 recall the exact date, but it was certainly before --

02:14 13 Q. Well you went over the exact date with Mr. Brock during
02:14 14 your direct examination, didn't you? Do you recall?

02:14 15 A. I'm sure I did, Mr. Cernich, but I can't remember the
02:14 16 exact date. It was certainly before the accident.

02:14 17 **MR. CERNICH:** Could we go to Demonstrative 23207B.

02:15 18 **BY MR. CERNICH:**

02:15 19 Q. This is a demonstrative that BP used during the source
02:15 20 control part of the case. Have you seen this document?

02:15 21 A. I don't recall seeing it, no.

02:15 22 Q. And BP's expert on hydraulic modeling testified -- he sat
02:15 23 in that very chair where you are right there and testified to
02:15 24 Judge Barbier about uncertainties associated with hydraulic
02:15 25 modeling inputs at Macondo during the response, and he

02:15 1 identified one of those uncertainties as permeability. Do you
02:15 2 see that?

02:15 3 A. Yes.

02:15 4 **MR. BROCK:** Your Honor, I'm just going to object to
02:15 5 testimony that we've already covered in the source control
02:15 6 case, as well as using exhibits that we used in that part of
02:15 7 the case. He's not seen this exhibit. He's not going to be
02:15 8 familiar with that testimony.

02:15 9 **MR. CERNICH:** Your Honor, I have an expert on
02:15 10 cross-examination and this goes to the reliability of the MDT
02:15 11 test specifically.

02:15 12 **THE COURT:** Wait, wait. Whose exhibit was this?

02:15 13 **MR. CERNICH:** This is BP's demonstrative that they
02:15 14 used with their hydraulic modeling expert.

02:15 15 **THE COURT:** All right. I'll let him answer that, if
02:15 16 he can.

02:16 17 Do you remember the question?

02:16 18 **MR. CERNICH:** Oh, I said: This identifies
02:16 19 permeability as an uncertainty associated with hydraulic
02:16 20 modeling?

02:16 21 That's what this says.

02:16 22 **THE COURT:** So what is your question for the witness?

02:16 23 **MR. CERNICH:** I'm going to move on to my question.

02:16 24 **BY MR. CERNICH:**

02:16 25 **Q.** And despite the fact that BP had the MDT data in April of

02:16 1 2010, they weren't willing to rely on that MDT data for
02:16 2 hydraulic modeling during the response?

02:16 3 **MR. BROCK:** I'm just going to object on foundation
02:16 4 there, Your Honor.

02:16 5 **THE COURT:** I sustain your objection.

02:16 6 **BY MR. CERNICH:**

02:16 7 **Q.** If BP had -- it's a pretty simple time line,
02:16 8 Professor Blunt. If BP had this data in April of 2010, then
02:16 9 they had this data all throughout the blowout; correct?

02:16 10 **MR. BROCK:** This is the question I objected to. I
02:16 11 thought you said sustained, but I may have misunderstood.

02:16 12 **THE COURT:** I don't know if I did or not --

02:16 13 **MR. BROCK:** I don't know either. I thought you did.

02:16 14 **THE COURT:** -- but I'll sustain it now. Okay.

02:17 15 **MR. CERNICH:** Could we go to Exhibit 3375, please.

02:17 16 **BY MR. CERNICH:**

02:17 17 **Q.** This is a document titled "Technical Memorandum" -- it's a
02:17 18 BP memorandum -- "Post-Well Subsurface Description of the
02:17 19 Macondo Well," dated the 25th of May, 2010.

02:17 20 You've seen this document, correct, Professor Blunt?

02:17 21 **A.** Yes.

02:17 22 **MR. CERNICH:** Could we go to -- could we go to
02:17 23 page 31, 3375.0031.

02:17 24 **BY MR. CERNICH:**

02:17 25 **Q.** Here we go. In this document, it says: "Mobilities from

02:17 1 MDT pre-tests confirm the two sands have high permeability in
02:17 2 the 100s of millidarcy range."

02:18 3 Did I read that correctly?

02:18 4 A. Yes.

02:18 5 Q. Okay. So BP wrote in this memo that you reviewed in
02:18 6 forming your expert opinions that as of May 2010, the MDT tests
02:18 7 had confirmed high permeability in the 100s of millidarcys?

02:18 8 A. I can see that the number that I've used is around 300
02:18 9 millidarcys. That is in the 100s of millidarcys.

02:18 10 Q. But the first time BP has used MDT data to quantify a
02:18 11 specific permeability number is in the context of this
02:18 12 litigation, isn't it?

02:18 13 MR. BROCK: Same objection. This is going right back
02:18 14 to the source control case, Your Honor. This is -- this is not
02:18 15 a proper question for this case.

02:18 16 MR. CERNICH: This is fair, Your Honor, because what
02:18 17 I'm trying to establish is that BP, during the response, didn't
02:18 18 rely on the exact same data --

02:18 19 THE COURT: Well, here's my question about your
02:18 20 question, I guess.

02:19 21 MR. CERNICH: Certainly.

02:19 22 THE COURT: And maybe the witness does know, but I
02:19 23 thought he testified earlier he was not involved in the
02:19 24 response effort. Am I correct about that?

02:19 25 THE WITNESS: I was not involved in the response

02:19 1 effort, no.

02:19 2 **THE COURT:** So would you have knowledge of this or
02:19 3 not?

02:19 4 **THE WITNESS:** I've read this document, but I have no
02:19 5 knowledge of the response effort.

02:19 6 **THE COURT:** In other words, you're asking him what BP
02:19 7 was doing during the response effort.

02:19 8 **MR. CERNICH:** Yes, BP, during the response effort --

02:19 9 **THE COURT:** But he says he wasn't involved.

02:19 10 **MR. CERNICH:** Let me try it really briefly.

02:19 11 During the response effort, BP told you, BP
02:19 12 testified to you that there was an uncertainty in -- in
02:19 13 permeability during the response that prevented them from doing
02:19 14 hydraulic modeling. And now BP wants to rely --

02:19 15 **THE COURT:** Okay. Well, if that's true, you can
02:19 16 point that out in post-trial brief. It's all in evidence, it's
02:19 17 in the record, and --

02:19 18 **MR. BROCK:** And we'll respond to it.

02:19 19 **THE COURT:** -- both sides can make whatever
02:19 20 inferences or arguments from that that you care to.

02:20 21 **MR. CERNICH:** We'll do that, Your Honor.

02:20 22 **BY MR. CERNICH:**

02:20 23 **Q.** Now, you talked during direct, Professor Blunt, about the
02:20 24 well test analysis that you performed. Do you recall that?

02:20 25 **A.** Yes.

02:20 1 Q. Okay. And you use your -- that well test or pressure
02:20 2 transient analysis to determine two of the three inputs in your
02:20 3 material balance calculation?

02:20 4 A. It basically directly informs one of the inputs, which is
02:20 5 the pressure decline, and it is also used as a component of
02:20 6 finding the connected oil volume.

02:20 7 Q. Right. So it's a necessary component?

02:20 8 A. It's a necessary component to quantify connectivity, yes.

02:20 9 Q. And it's a necessary component to quantify the connected
02:21 10 volume in your analysis?

02:21 11 A. Yes. I use it to find the connected volume in combination
02:21 12 with other variables.

02:21 13 Q. Isn't it true, Professor Blunt, that you've only performed
02:21 14 a few well test analyses in your career?

02:21 15 A. Yes, that's correct. I've -- I've performed a few.

02:21 16 Q. And in performing those well test analyses, you always use
02:21 17 commercial software?

02:21 18 A. Before -- before this case, yes, I used commercial
02:21 19 software.

02:21 20 Q. And this well test analysis was unique?

02:21 21 A. As I think I said in my deposition, this well test
02:21 22 analysis, of course, has a number of unique features specific
02:21 23 to Macondo, but the methodologies that I've applied are
02:21 24 completely standard.

02:21 25 Q. In fact, the well test analysis described in your expert

02:21 1 report, this is the first time you've ever done a well test
02:21 2 analysis in this way?

02:22 3 A. Yes. It's right in that it's the first time I derived all
02:22 4 the equations by hand and then applied it to real field data.
02:22 5 But I've looked at real field data using commercial software,
02:22 6 and I have hitherto derived some of the equations in well test
02:22 7 analysis by hand.

02:22 8 Q. And commercial software requires flow rate as an input,
02:22 9 doesn't it?

02:22 10 A. I don't know if that's true of every single piece of
02:22 11 commercial software, to be honest. But certainly the software
02:22 12 that I have used, my understanding is that you need to input a
02:22 13 flow rate.

02:22 14 Q. The well test software that Professor Gringarten used for
02:22 15 his analysis, that required a flow rate, didn't it, as an
02:22 16 input?

02:22 17 A. I'm afraid I'm not familiar with the software that
02:22 18 Professor Gringarten used, so I can't comment.

02:22 19 Q. Okay. And you don't know whether Dr. Gringarten, in his
02:22 20 analysis, inputted a flow rate into his well test software?
02:22 21 From reading his report, you can't tell that?

02:22 22 A. The implication from reading his report, since he
02:22 23 calculates a flow rate, is that he did input a flow rate.

02:23 24 Q. And this wasn't a conventional well test that you
02:23 25 performed here. Because for a conventional well test, you have

02:23 1 flow rates and measured downhole pressures, and you had neither
02:23 2 of those for Macondo?

02:23 3 A. That is, indeed, correct. Normally, you would have some
02:23 4 measured flow rates and you'd be measuring the pressures
02:23 5 downhole. It introduces some additional challenges to the
02:23 6 analysis, but the pressure response can be analyzed using
02:23 7 perfectly standard, industry-standard techniques.

02:23 8 Q. Now, moving on to your pressure analysis and its use to
02:23 9 determine your connected volume.

02:23 10 Your total amount of oil produced is directly
02:23 11 proportional to your connected volume?

02:23 12 A. Yes, it is, although, you have to have a proper
02:23 13 consistency check as an example. You can't just input random
02:23 14 numbers into the spreadsheet and use that as a definitive
02:24 15 determination.

02:24 16 Q. I'm not even talking about the spreadsheet now. I'm just
02:24 17 talking about your equation, your simple equation. If I double
02:24 18 N, your oil in place, it doubles the -- it doubles the
02:24 19 cumulative oil released?

02:24 20 A. As a mathematical exercise, that's correct. But you do
02:24 21 need to check the consistency and the totality of the data, as
02:24 22 I described in Section 5 of my report.

02:24 23 Q. Professor Gringarten -- I'm sorry, you used a rectangular
02:24 24 flow model from a textbook and you coupled that with a linear
02:24 25 flow model you derived in Appendix C of your report?

02:24 1 A. Yes. It's correct in a sense that I do consider two flow
02:24 2 models, a linear flow model and a rectangular flow model.

02:24 3 Q. It's not correct "in a sense." My question was: You used
02:24 4 a rectangular flow model and a linear flow model, and you
02:24 5 coupled those to do your analysis. That's a true statement,
02:25 6 isn't it?

02:25 7 A. It is, broadly speaking. It's the word "coupled" I didn't
02:25 8 quite understand. But, yes, I used a linear flow model and I
02:25 9 used a rectangular flow model in my analysis.

02:25 10 Q. And now Professor Gringarten just used a single
02:25 11 rectangular flow model?

02:25 12 A. Yes.

02:25 13 Q. And he's the world expert in well testing, as you
02:25 14 testified earlier?

02:25 15 A. Yes.

02:25 16 Q. And in your deposition, you talked about how you,
02:25 17 personally, derived all of these equations, and you mentioned
02:25 18 some of that today, in your Appendix C, your linear reservoir
02:25 19 model, you derived in Appendix C; right?

02:25 20 A. Yes.

02:25 21 Q. But you didn't do anything to validate that model by
02:25 22 comparing it to any industry-accepted programs, did you?

02:25 23 A. I did validate it in a number of ways, both analytically
02:25 24 checking the results against the rectangular flow model. But
02:25 25 you're right: I didn't perform a validation using commercial

02:25 1 well test software.

02:26 2 Q. In Appendix C of your report, where you derive your linear
02:26 3 flow model, there's 68 equations there; correct?

02:26 4 A. That seems, broadly speaking, correct.

02:26 5 Q. And you said you didn't trust commercial software, so you
02:26 6 did that math yourself?

02:26 7 A. I wouldn't say that I didn't trust commercial software.

02:26 8 **THE WITNESS:** I've used it in the past, Your Honor.

02:26 9 But for the circumstances of this case, I wanted
02:26 10 to understand every single nuance. I wanted to be able to say,
02:26 11 as an expert, I've gone through all the equations, I know
02:26 12 exactly what I've done, and have complete control over the
02:26 13 analysis, rather than using, say, a black box that I don't
02:26 14 fully understand.

02:26 15 And the other reason that you quite rightly have
02:26 16 pointed out already is I need to input a flow rate, and I don't
02:26 17 know a flow rate.

02:26 18 **BY MR. CERNICH:**

02:26 19 Q. This isn't the type of analysis you'd use in real oilfield
02:26 20 operations, is it?

02:26 21 A. Well test analysis would be routinely used in real
02:26 22 oilfield operations.

02:26 23 Q. Not the well test analysis you did, Professor Blunt?

02:26 24 A. Yes, in the sense that you would normally use commercial
02:26 25 software; but no in the sense that this is perfectly standard,

02:27 1 industry-standard methodology.

02:27 2 Q. Your methodology isn't commercial well test software, is
02:27 3 it?

02:27 4 A. It is not commercial well test software. I derived all
02:27 5 the equations by hand so that I knew all the details of my
02:27 6 analysis.

02:27 7 Q. And you checked and re-derived all of those equations?

02:27 8 A. Yes.

02:27 9 Q. Since your deposition, have you found any errors in any of
02:27 10 your equations found in Appendix C in your report?

02:27 11 A. No.

02:27 12 Q. I'd like to talk briefly about fluid properties,
02:27 13 Professor Blunt.

02:27 14 If you increase your shrinkage factor by 10 percent,
02:27 15 your cumulative oil released would also increase by 10 percent;
02:27 16 isn't that right?

02:27 17 A. That's correct.

02:27 18 Q. And you use an FVF, a formation volume factor, in the
02:27 19 range of 2.27 to 2.35?

02:27 20 A. Again, I can't recall the exact numbers but that seems
02:28 21 perfectly reasonable.

02:28 22 MR. CERNICH: Could we go to Demonstrative D-22105.

02:28 23 BY MR. CERNICH:

02:28 24 Q. And this -- this is a demonstrative that plots out the
02:28 25 various shrinkage factors of experts in this case. Just, for

02:28 1 the record, to be clear, I understand that your range does
02:28 2 overlap with Professor Whitson over there on the single stage.
02:28 3 So I just want to make sure that we're aware of that and
02:28 4 everyone -- and it's clear for the record.

02:28 5 But your -- your FVF that you use in your analysis,
02:28 6 it lines up with the -- with the highest shrinkage factor out
02:28 7 of these; isn't that true?

02:28 8 A. It's -- the lowest number there is to the left of the
02:28 9 graph, that's right. But you've put my name against it. I
02:28 10 would say not unreasonably, because they're the numbers I use,
02:29 11 but they're actually measured data. None of the other -- none
02:29 12 of the other numbers that you see there, Your Honor, are
02:29 13 actually measured data.

02:29 14 Q. Professor Whitson didn't use measured data?

02:29 15 A. He used measured data to calibrate his model. And that's
02:29 16 why my range, which is the range of the measured data -- and,
02:29 17 actually, as you quite rightly say, straddles Whitson's. So,
02:29 18 in fact, mine should be like that. Whitson has a model that's
02:29 19 consistent with the data; Dr. Zick has a model that is not
02:29 20 consistent with the data.

02:29 21 Q. And Professor Whitson, you said, is one of the foremost
02:29 22 experts in fluids in the world?

02:29 23 A. Yes.

02:29 24 Q. And you rely on him in your analyses?

02:29 25 A. I use his data for two components of my analysis for

02:29 1 looking at densities for the cooling calculation in two out of
02:29 2 three cases and for viscosity.

02:29 3 Q. Right. And you understand that Professor Whitson's
02:29 4 single-stage shrinkage factor that he uses here is the one that
02:30 5 assumes that a certain percentage of those hydrocarbons simply
02:30 6 dissolve into the Gulf?

02:30 7 A. So --

02:30 8 Q. He cuts out C1 through C6 from his analysis because he
02:30 9 assumes that they dissolve in the water column.

02:30 10 A. So just for clarification, and what you've got there is
02:30 11 Dr. Whitson's single-stage flash. My understanding is that's a
02:30 12 single-stage separation. But it is true, his equation of state
02:30 13 does match quite accurately the experimental data.

02:30 14 Q. Eliminating the hydrocarbons that dissolve into the Gulf
02:30 15 of Mexico?

02:30 16 **THE WITNESS:** I'm sorry, I'm -- I'm genuinely a
02:30 17 little bit confused, Your Honor. The single-stage separation,
02:30 18 as I think I've described earlier, is simply where the oil and
02:30 19 gas stay in contact and all the way from the reservoir to the
02:31 20 surface. In my opinion, that's a perfectly plausible, possible
02:31 21 model of what actually happened in Macondo and doesn't involve
02:31 22 any discount from dissolution.

02:31 23 Q. I'm sorry, Professor Blunt, for the confusion. I was
02:31 24 confused. That is actually Professor Whitson's oceanic
02:31 25 separation, the 46.7 to 48.0 there on the chart.

02:31 1 A. I'm sorry. I don't know it.

02:31 2 Q. Professor Whitson's oceanic separation is the one where he
02:31 3 assumes that a certain percentage of the hydrocarbons simply
02:31 4 dissolve into the water column.

02:31 5 A. Yes. I'm aware that Dr. Whitson provides a detailed
02:31 6 analysis of what he thinks might have happened to the oil and
02:31 7 gas all the way from the reservoir to the surface. And he
02:31 8 arrives at a number that's actually very close to a
02:31 9 single-stage separation, which is, again, as I've said, I
02:31 10 consider to be perfectly reasonable.

02:32 11 Q. Right. His single-stage separation assumes that
02:32 12 dissolution.

02:32 13 A. No. Single-stage separation --

02:32 14 **THE WITNESS:** Let me explain, Your Honor.

02:32 15 **BY MR. CERNICH:**

02:32 16 Q. I just asked --

02:32 17 A. No, no. Single-stage separation --

02:32 18 Q. No, I'm asking about Professor Whitson's. I'm not asking
02:32 19 for an explanation.

02:32 20 **MR. CERNICH:** I'll move on, Your Honor. The
02:32 21 question's withdrawn.

02:32 22 Can we go to exhibit --

02:32 23 **THE COURT:** Wait, wait, wait, wait. Before you move
02:32 24 on, I've got a question for the witness. I'm trying to
02:32 25 understand the relevance and significance of these different

02:32 1 values here. Okay.

02:32 2 Your number that you use in coming up with the
02:32 3 3.26 --

02:32 4 **THE WITNESS:** Yes.

02:32 5 **THE COURT:** -- was what? That 42.3 or 44? Which was
02:32 6 it?

02:32 7 **THE WITNESS:** The whole range, Your Honor.

02:32 8 **THE COURT:** The whole range?

02:32 9 **THE WITNESS:** I looked at, in fact, three sets of
10 fluid data from the three service companies.

02:32 11 **THE COURT:** For 3.2 -- oh, I see. And then you
12 averaged it out to come up with the 3.26?

02:32 13 **THE WITNESS:** Yes, yes.

02:32 14 **THE COURT:** I understand. Okay. I'm trying to get
15 some sense of proportion here.

02:32 16 Just for the sake of argument here, if you had
17 used the highest number on this table here, 50.9, give me some
18 sense of what that would do to your ultimate number.

02:33 19 **THE WITNESS:** Obviously, I'm trying to do the math on
20 the fly, but we're looking 7 out of 40, so it would be an
21 increase, I would say, of about 15 percent, maybe a little bit
22 more.

02:33 23 **THE COURT:** Would it be -- okay.

02:33 24 **THE WITNESS:** So that's --

02:33 25 **THE COURT:** I did the math. I was estimating

02:33 1 20 percent, but that's why I asked you.

02:33 2 **THE WITNESS:** A little less. Somewhere between --
02:33 3 Your Honor, we can do the calculation. It's somewhere between
02:33 4 15 and 20 percent.

02:33 5 **THE COURT:** Well, the reason -- I'm looking at 50.9
02:33 6 minus 42, 43. Roughly 8 -- 8 -- 18, 20 percent probably,
02:33 7 somewhere up in there?

02:33 8 **THE WITNESS:** Yes, yes.

02:33 9 **THE COURT:** Okay. So going back to a question that
02:33 10 you had answered earlier, 10 percent would increase, if you
02:34 11 assume that number, that higher value for shrinkage factor,
02:34 12 higher number but lower shrinkage; right?

02:34 13 **THE WITNESS:** Yes, it would. This is one thing, just
02:34 14 to clarify, Mr. Cernich is completely correct. You can simply
02:34 15 take my number and apply a different conversion, and you get a
02:34 16 different number.

02:34 17 And I, as I've already --

02:34 18 **THE COURT:** But just to understand the relevance --
02:34 19 the relationship here would be 18 to 20 percent higher if that
02:34 20 last number was used -- doing everything else you did the same?

02:34 21 **THE WITNESS:** Yes. That's -- something in that
02:34 22 ballpark, Your Honor.

02:34 23 **THE COURT:** Okay. All right. Go ahead.

02:34 24 **MR. CERNICH:** Thank you, Your Honor.

02:34 25 Really quickly could we go to D-22106, please.

02:34 1 **BY MR. CERNICH:**

02:35 2 **Q.** And this demonstrative simply shows the inverse -- I'm
02:35 3 sorry. This shows -- this is the FVF that corresponds to those
02:35 4 shrinkage factors. Is that correct, Professor Blunt?

02:35 5 **A.** Yes.

02:35 6 **Q.** And the numbers we have for you are correct there?

02:35 7 **A.** They're correct, but the graphic is, as you've already
02:35 8 pointed out --

02:35 9 **Q.** It overlaps.

02:35 10 **A.** -- misleading because it straddles, in fact, Whitson's
02:35 11 calculations.

02:35 12 **Q.** In your report you cite multiple times to BP's Phase One
02:35 13 expert, Morten Emilsen of ADD Energy; is that right?

02:35 14 **A.** I do refer to Dr. Emilsen's report, and I perform an
02:35 15 analysis in Appendix E that's using some of the information in
02:35 16 his report.

02:35 17 **Q.** And Mr. Emilsen, who testified right there in that chair
02:35 18 in Phase One of this case, he used a formation volume factor of
02:35 19 2.14, didn't he?

02:35 20 **A.** Yes, I'm aware of that.

02:35 21 **Q.** And that's similar to the FVF used by the United States
02:36 22 experts in this case?

02:36 23 **A.** It is. But all I can say is I don't know precisely the
02:36 24 pressure and temperature conditions or the separation process
02:36 25 that Dr. Emilsen was assuming in his analysis. So I note the

02:36 1 number, and I, personally, don't think that that's the
02:36 2 appropriate number to use.

02:36 3 Q. So you're in disagreement with BP's Phase One expert who
02:36 4 testified?

02:36 5 A. Not necessarily. What I'm saying is, for the purposes of
02:36 6 my calculation, as a reservoir engineering calculation, for the
02:36 7 reasons I've already described, I actually think a single-stage
02:36 8 separation based on the measured data is the appropriate
02:36 9 conversion factor.

02:36 10 I simply don't know the circumstances in which
02:36 11 Dr. Emilsen used a different number.

02:36 12 MR. CERNICH: Could we go to Professor Blunt's
02:36 13 report, please. I'd like to go to 11553.0027.

02:37 14 BY MR. CERNICH:

02:37 15 Q. This is page 27 of your report. And here you write --

02:37 16 MR. CERNICH: I'm sorry. This is -- this is the
02:37 17 wrong call-out. Could we go up the page, please, Don. And
02:37 18 just call out that paragraph.

02:37 19 BY MR. CERNICH:

02:37 20 Q. Here you write: "When oil companies normally produce oil,
02:37 21 they separate the oil and exsolved gas through a deliberately
02:37 22 engineered series of separators at a succession of decreasing
02:37 23 temperatures and pressures. This multistage separation is
02:37 24 designed to produce as much (valuable) oil and as little (less
02:37 25 valuable) gas as possible."

02:37 1 And that's what you wrote in your report, isn't it,
02:38 2 Professor Blunt?

02:38 3 A. Yes, it is.

02:38 4 Q. Now, with a lower FVF, your "N," your connected volume,
02:38 5 would increase?

02:38 6 A. Yes, it would. In the simple presentation of the material
02:38 7 balance equation, that will be the number that will change.
02:38 8 And as I said, in this particular case, you would need to self
02:38 9 consistency check, it would increase by -- the amount by which
02:38 10 you changed the conversion factor.

02:38 11 Q. Now, you talked about the wellbore cooling calculation
02:38 12 that you performed to determine bottom hole pressures on
02:38 13 direct. And that's in your report?

02:38 14 A. Yes. The details are in Appendix B of my report.

02:38 15 Q. I think you referred to this calculation on direct as
02:39 16 straightforward. Do you recall that?

02:39 17 A. I can't remember those words. I would say that it uses
02:39 18 straightforward, basic physical principles. There are, of
02:39 19 course -- as always, you need to pay attention to details. And
02:39 20 as I said, all the details are in Appendix B of my report.

02:39 21 Q. And your Appendix B is about 20 pages of analysis; is that
02:39 22 right?

02:39 23 A. That wouldn't surprise me.

02:39 24 Q. Now, according to you, there are uncertainties in your
02:39 25 wellbore temperature calculation?

02:39 1 A. Indeed, there are. And I've examined them carefully in
02:39 2 this 20 pages of analysis, and my conclusion is that I have a
02:39 3 robust, accurate conversion from capping stack to reservoir
02:39 4 pressures that I can use in further analysis.

02:39 5 Q. But you make a number of approximations to do those
02:40 6 calculations?

02:40 7 A. Indeed, I do.

02:40 8 **THE WITNESS:** Any calculation of this nature, Your
02:40 9 Honor, would involve some approximations. And I've examined
02:40 10 them very carefully in the details of the report. And as I
02:40 11 said, I think I have a robust -- a robust and accurate
02:40 12 conversion.

02:40 13 **BY MR. CERNICH:**

02:40 14 Q. But that does add uncertainty to your calculated bottom
02:40 15 hole pressure.

02:40 16 A. It does. And I've carried the principal source of that
02:40 17 uncertainty, which is the fluid properties. In fact, I've
02:40 18 looked at the three sets of fluid properties and carried that
02:40 19 forward in my calculations.

02:40 20 Q. You use a temperature of 243 degrees for the entire
02:40 21 wellbore during the flowing period?

02:40 22 A. Yes, that's correct. I checked that out. It's,
02:40 23 obviously, not precisely correct, but it's reasonably accurate.
02:40 24 And, if anything, allowing less heating would, in fact, lead
02:40 25 eventually to less oil released.

02:40 1 Q. But that 243-degree assumption that you use, that's not
02:41 2 physical?

02:41 3 A. It's a perfectly physical assumption. It's an accurate
02:41 4 assumption in the sense that I've checked it out. I actually
02:41 5 calculate, well, what would be the degree of cooling during the
02:41 6 flowing period? It's about 6 degrees F.

02:41 7 So I may be off, at most, because it's an average,
02:41 8 right, from no error at the reservoir to 6 degrees at the
02:41 9 surface, I'm off by about 3 degrees, and that affects my
02:41 10 calculation of pressure by about 4 psi. You know, below the
02:41 11 resolution of the gauge.

02:41 12 So I have checked it out. It's a perfectly
02:41 13 reasonable, accurate approximation to use.

02:41 14 Q. But it does add uncertainty to your analysis?

02:41 15 A. Yes, it does, but a very small one.

02:41 16 MR. CERNICH: Could we go to page 77 of
02:41 17 Professor Blunt's report. Could we pull out Table B-2 there.

02:42 18 BY MR. CERNICH:

02:42 19 Q. Here, this is Table B-2, and you label "parameters used
02:42 20 for my calculation of wellbore cooling." Isn't that right?

02:42 21 A. Yes.

02:42 22 Q. Now, the values of cement in this table aren't correct,
02:42 23 are they?

02:42 24 A. I have no reason to believe they're not correct. In my
02:42 25 deposition, you pointed to a paper where there were different

02:42 1 values for the cement properties. Cement -- I'm not an expert
02:42 2 in cement, but I have reviewed some of the literature. The
02:42 3 thermal properties of cement can vary over a wide range.

02:42 4 I actually considered varying the thermal properties
02:42 5 by a factor of at least 10 in my analysis, and, again, it
02:43 6 didn't make any significant difference to my conclusions.

02:43 7 Q. Now, you told me in your deposition that you only used a
02:43 8 few of these parameters in your wellbore cooling model. Is
02:43 9 that correct?

02:43 10 A. No.

02:43 11 **THE WITNESS:** Let me clarify, Your Honor. You see a
02:43 12 very long list of parameters there, which could be bewildering.
02:43 13 I've used all of these in some of my calculations to look at
02:43 14 the sensitivities, to examine the uncertainties that
02:43 15 Mr. Cernich is referring to.

02:43 16 In the end, however, having assured myself that
02:43 17 I have a robust and accurate model, I've only used a subset of
02:43 18 those properties for my, one might say, base case that I carry
02:43 19 forward to further quantitative calculations.

02:43 20 **BY MR. CERNICH:**

02:43 21 Q. And one of the ones you didn't carry forward was the
02:43 22 thermal conductivity of cement?

02:44 23 A. That's correct. I show in my expert report that including
02:44 24 the insulating properties of the annular region, if anything,
02:44 25 would lead to sharper wellbore cooling and an estimate of less

02:44 1 oil released.

02:44 2 Instead, I used a simplification -- but, again, a
02:44 3 perfectly reasonable simplification -- after about one day of
02:44 4 cooling that ignored that annular region.

02:44 5 Q. But cement acts as an insulator, doesn't it?

02:44 6 A. Yes, it is an insulator.

02:44 7 Q. And if you had accounted for the insulating power of
02:44 8 cement, your wellbore would have stayed hotter longer?

02:44 9 You discussed the laws of thermodynamics during your
02:44 10 direct, Professor Blunt.

02:44 11 A. Actually, that's not necessarily the case, and I do
02:44 12 examine that in my Appendix B.

02:45 13 Q. And if the wellbore had stayed hotter longer, that would
02:45 14 have resulted in a less dense fluid in the wellbore?

02:45 15 A. That's true.

02:45 16 **THE WITNESS:** But the reason why it's that complex,
02:45 17 Your Honor, not quite as simple as being characterized here.
02:45 18 If you have an insulating cement, less heat goes into the
02:45 19 formation during the flowing period. It's slightly slower for
02:45 20 the heat to go back in, but there's less heat to go back in, so
02:45 21 the overcooling can be more rapid.

02:45 22 It's difficult to explain in words, but I've
02:45 23 done the analysis rigorously, and the analysis is presented in
02:45 24 my report, and it shows that including the insulating behavior
02:45 25 would, if anything, have led me to calculate a lower

02:45 1 permeability for the formation and to estimate less oil
02:45 2 released.

02:45 3 Q. Now, you claim in your model that you can match pressures
02:45 4 at the bottom of the hole to within 2 psi?

02:46 5 A. Yes, my model matches to within 2 psi on average. That's
02:46 6 the root means square error.

02:46 7 Q. But the gauge resolution of the capping stack pressure
02:46 8 gauge, 13,000 feet above the bottom of the well, is only plus
02:46 9 or minus 5 psi.

02:46 10 A. Yes, and I provide an explanation of how that's possible
02:46 11 in my expert report.

02:46 12 Q. Professor Gringarten used your conversions of capping
02:46 13 stack pressures, the bottom hole pressures in his analysis; is
02:46 14 that right?

02:46 15 A. Yes.

02:46 16 Q. And using those pressures, Professor Gringarten calculates
02:46 17 a lower final average pressure than you; isn't that right?

02:46 18 A. Indeed, he does. He calculates a slightly lower final
02:46 19 average reservoir pressure, which means a slightly larger
02:46 20 pressure decline, than I do. But that number has to be looked
02:46 21 in the context of his model.

02:46 22 **MR. CERNICH:** If we could go to D-21666, please.

02:47 23 **BY MR. CERNICH:**

02:47 24 Q. This demonstrative shows the ranges of your final average
02:47 25 pressure and Professor Gringarten's final average pressure. Do

02:47 1 you see that?

02:47 2 A. Yes.

02:47 3 Q. And does this accurately represent the range of your final
02:47 4 average reservoir pressure?

02:47 5 A. As far as I am aware, it does. I don't agree with the
02:47 6 text, but I'll accept the numbers.

02:47 7 Q. And Professor Kelkar's final average pressure is actually
02:47 8 over in Professor Gringarten's range, isn't it?

02:47 9 A. Yes. Completely coincidentally. Because I've already
02:47 10 discussed his analysis.

02:47 11 Q. But it's in Professor Gringarten's range, a range that you
02:47 12 determine is correct?

02:47 13 A. I have no reason to doubt Professor Gringarten's analysis.

02:47 14 **THE WITNESS:** He uses a slightly different flow model
02:47 15 to mine, Your Honor, so he tends to find a slightly larger
02:47 16 pressure drop with a slightly smaller reservoir.

02:48 17 And I've gone through every case in Professor
02:48 18 Gringarten's expert report, and I've put that in the context of
02:48 19 my own model. And the final conclusions in terms of oil
02:48 20 released are consistent within 1 percent.

02:48 21 Q. So, in your opinion, Professor Gringarten's final average
02:48 22 pressure measurements are reasonable?

02:48 23 A. They're perfectly reasonable in the context of the model
02:48 24 that he's using.

02:48 25 Q. But you -- and if we use them in your model -- if we use

02:48 1 them in your -- I'm sorry. If we use them in your material
02:48 2 balance calculation, we'd result in a larger amount of oil
02:48 3 released?

02:48 4 A. No, not necessarily. As I've said and I've tried to
02:48 5 stress that you can't pick and choose your variables.

02:48 6 You can use a delta P, but the delta P has to be
02:48 7 consistent with your flow model and the connected reservoir
02:48 8 area.

02:48 9 Professor Gringarten's delta P is slightly larger.
02:48 10 His reservoir area is slightly smaller. The two effects cancel
02:49 11 out, and I've checked that. The models are consistent.

02:49 12 Q. But you've taken his permeability and put that into your
02:49 13 model?

02:49 14 A. Yes. The permeability is determined completely
02:49 15 independently from the MDT test. And that's the largest -- as
02:49 16 we've already discussed, that's the upper bound permeability.
02:49 17 There are other permeability numbers that I might even
02:49 18 consider, you know, one would say, more plausible. So I've
02:49 19 used the upper bound in order to have an upper bound on my
02:49 20 calculation of oil released.

02:49 21 Q. But you picked Professor Gringarten's permeability number
02:49 22 and put that into your models to do your analysis?

02:49 23 A. Yes. And I've also checked that if I were to use his flow
02:49 24 model and his pressure drop, I would arrive at a calculation of
02:49 25 oil released that's within 1 percent of what's presented in my

02:49 1 expert report. Because you can't just take the delta P in
02:49 2 isolation.

02:49 3 Q. You have different final average pressure calculations
02:50 4 than Professor Gringarten; right?

02:50 5 A. Yes, I do.

02:50 6 Q. Who's correct?

02:50 7 A. Both of us have come up with perfectly reasonable
02:50 8 determinations within the context of our models. So it's
02:50 9 impossible to say who is correct.

02:50 10 But it has to be consistent. Professor Gringarten,
02:50 11 as I said before, he's saying, all things being equal, that we
02:50 12 have a slightly smaller connected reservoir area, but the
02:50 13 pressure drop is slightly higher.

02:50 14 I'm saying, with my linear model, that we really have
02:50 15 quite a large connected area, relatively speaking, but a
02:50 16 slightly lower pressure drop. And the two things cancel out in
02:50 17 the determination of oil released.

02:50 18 Q. Isn't there just one final average pressure?

02:50 19 A. Yes, as a physical fact.

02:50 20 **THE WITNESS:** Of course, Your Honor, if we want to
02:50 21 know what the final reservoir pressure was, there would be one
02:50 22 number, and we would see, so to speak, who was right.

02:51 23 But for the data that we have, both of these
02:51 24 determinations, that is, Gringarten and -- Professor Gringarten
02:51 25 and myself, are perfectly reasonable, consistent with the data.

02:51 1 But you have to look at it in the context of a consistent flow
02:51 2 model as well; something, I'd have to say, that Dr. Kelkar did
02:51 3 not do.

02:51 4 Q. So you don't know what that final average reservoir
02:51 5 pressure is?

02:51 6 A. Of course, I don't know for sure. But I have a flow model
02:51 7 that matches the data, that is consistent with the geology and
02:51 8 geophysics and all the other data that I've looked at. And
02:51 9 that's the best any scientist can do.

02:51 10 MR. CERNICH: Could I have the ELMO, please.

02:52 11 BY MR. CERNICH:

02:52 12 Q. This is a demonstrative that was used on direct with you;
02:52 13 is that right, Professor Blunt?

02:52 14 A. Yes.

02:52 15 THE COURT: I thought this was the one you objected
02:52 16 to, Mr. Cernich.

02:52 17 MR. CERNICH: It is, Your Honor.

02:52 18 THE COURT: Now you're using it?

02:52 19 MR. CERNICH: I'm trying to correct it, if you'll
02:52 20 give me a little leeway here.

02:52 21 MR. BROCK: Objection.

02:52 22 THE COURT: All right. We'll see where this all
02:52 23 goes.

02:52 24 BY MR. CERNICH:

02:52 25 Q. So this comes out of your report except for the part about

02:52 1 Dr. Zaldivar; is that right?

02:52 2 **THE WITNESS:** Well, Your Honor, as I've tried to
02:52 3 explain this morning -- obviously, I did a bad job of it --
02:52 4 I've put in the rectangle there with the flow rates from the
02:53 5 Zaldivar report. But I've also -- in my expert report, the
02:53 6 flow rate simply goes from zero to 1. It's a normalized flow
02:53 7 rate, normalized to final day flow rate.

02:53 8 So I've also multiplied on the Y-axis by the
02:53 9 final day flow rate.

02:53 10 **BY MR. CERNICH:**

02:53 11 **Q.** The Court's also heard testimony in this case about other
02:53 12 daily flow rates. He heard testimony that Professor Zaldivar's
02:53 13 calculations were off by a factor of 2.

02:53 14 So if we double Professor Zaldivar's numbers, we come
02:53 15 up into this range, if we do that -- if we multiply that by a
02:53 16 factor of 2; correct?

02:53 17 **A.** Well, if you double the numbers, they'll be up there. I
02:53 18 can't comment on the validity of that particular assumption.

02:53 19 **Q.** And the Court's also heard testimony about a flow rate --
02:53 20 a flow rate calculation for the Top Kill period of approx- --
02:54 21 of greater than 60,000 barrels per day, and that would be
02:54 22 somewhere up in this range.

02:54 23 Am I getting the scale on that close,
02:54 24 Professor Blunt?

02:54 25 **A.** Well, I'm -- as I've said, I'm not here to proffer opinion

02:54 1 on the flow rates during Top Kill, so I can't comment one way
02:54 2 or the other. You've indicated 60,000 on the graph --

02:54 3 Q. It's an X/Y graph. Yeah, I've indicated 60,000. That's
02:54 4 all I'm asking.

02:54 5 A. Yeah.

02:54 6 Q. And then a Top Kill calculation -- I'm sorry -- a Top Hat
02:54 7 calculation in the range of 60,000 barrels per day as well?

02:54 8 THE COURT: Which one came first, because I may have
02:54 9 it backwards in my mind.

02:54 10 MR. CERNICH: Oh, certainly, Your Honor --

02:54 11 THE COURT: Did Top Hat come after Top Kill?

02:54 12 MR. CERNICH: No, the Top Hat was put on the well
02:55 13 after the Top Kill.

02:55 14 THE COURT: Okay. I just wondered. We've talked
02:55 15 about a lot of top this and top that.

02:55 16 BY MR. CERNICH:

02:55 17 Q. And I'm not asking you to validate those analyses,
02:55 18 Professor Blunt. My only question is: That if those point
02:55 19 estimates are, in fact, correct, then your -- the curve you
02:55 20 have in your report can't be correct? Just as a logic
02:55 21 exercise.

02:55 22 A. As a logical exercise, that does appear to be the case.
02:55 23 I'm not proffering an opinion of what the flow rate history
02:55 24 was.

02:55 25 But what I can say is that the reservoir data that

02:55 1 I've analyzed says that the cumulative needs to be within the
02:55 2 2.9 to 3.7 million stock tank barrels range. So if it's
02:55 3 outside that cumulative, then I would have a problem because it
02:55 4 violates the data that I've analyzed.

02:55 5 **MR. CERNICH:** I'm going to label this as D-2357B.

02:56 6 **BY MR. CERNICH:**

02:56 7 **Q.** And you also looked at this demonstrative,
02:56 8 Professor Blunt, during your -- during your direct exam;
02:56 9 correct?

02:56 10 **A.** Yes.

02:56 11 **Q.** And it says: "Average value from Macondo, 6.3 microsips."
02:56 12 And it has a page from a Weatherford lab report on it; is that
02:56 13 right?

02:56 14 **A.** I can see that.

02:56 15 **Q.** But that number, 6.35 microsips, doesn't actually appear
02:56 16 in that Weatherford laboratory report, does it?

02:56 17 **A.** Not directly, no. You're right. But it is based on an
02:56 18 analysis of the raw data.

02:56 19 **MR. CERNICH:** I'm going to label that as D-23541.

02:57 20 **MR. BROCK:** The answer he gave was that it is based
02:57 21 on the analysis of the Weatherford data. So if you're going to
02:57 22 quote him and write it on there, let's put that in there, too,
02:57 23 please.

02:57 24 **THE COURT:** What did you write on there? Let's see
02:57 25 it. Put it back on the screen.

02:57 1 **MR. CERNICH:** Certainly. So that number is not in
02:57 2 the Weatherford report. I can put "number" in front of it.
02:57 3 And I'm going to add a B to the demonstrative.

02:57 4 **MR. BROCK:** That's based on an average of the values
02:57 5 that are in that report. That's the purpose for which it was
02:57 6 used.

02:57 7 **THE COURT:** All right. Well, you can have him
02:57 8 explain that.

02:57 9 **MR. BROCK:** All right.

02:57 10 **BY MR. CERNICH:**

02:57 11 **Q.** And then, finally, this demonstrative, which shows a
02:57 12 permeability of 300 millidarcys with wellbore cooling. Did you
02:57 13 look at this demonstrative on direct?

02:57 14 **A.** Yes.

02:57 15 **Q.** And that 300 millidarcys is based on an assumed flow rate
02:58 16 of 45,000 barrels per day; correct?

02:58 17 **A.** It uses a final day flow rate of 45,000 stock tank barrels
02:58 18 a day.

02:58 19 **Q.** Assumed; correct?

02:58 20 **A.** Yes.

02:58 21 **MR. CERNICH:** I'll label this D-2365B.

02:58 22 Oh, and on this I wrote: "Assumed flow rate
02:59 23 45,000 stock tank barrels per day."

02:59 24 Thank you, Professor Blunt. That's all I have.

02:59 25 **THE COURT:** I do need to take a phone call, and it's

02:59 1 just about time for a recess anyways, so we'll just go ahead
02:59 2 and take our 15-minute recess.

02:59 3 **THE DEPUTY CLERK:** All rise.

02:59 4 (WHEREUPON, the Court took a recess.)

03:01 5 **THE DEPUTY CLERK:** All rise.

03:21 6 **THE COURT:** All right. Please be seated, everyone.

03:21 7 All right, Mr. Brock.

03:21 8 **MR. BROCK:** Thank you, Your Honor.

03:21 9 **REDIRECT EXAMINATION**

03:21 10 **BY MR. BROCK:**

03:21 11 **Q.** Dr. Blunt, thank you for your patience today. Just a few
03:21 12 more questions.

03:21 13 One of the things that you were asked about in
03:21 14 cross-examination concerned exploring the sensitivity of
03:21 15 increasing the reservoir area in your spreadsheet.

03:21 16 Do you remember that question?

03:21 17 **A.** Yes, I do.

03:21 18 **Q.** All right. And I think you were trying to say that you
03:22 19 could comment on the calculation counsel made in the
03:22 20 spreadsheet by varying the parameter of reservoir area.

03:22 21 Is there a comment that you would like to make on
03:22 22 that, to share with Judge Barbier?

03:22 23 **A.** Yes, I would.

03:22 24 **THE WITNESS:** Your Honor, obviously, in doing my
03:22 25 calculations to make sure everything was correct, I put

03:22 1 everything in a spreadsheet that, obviously, I've made
03:22 2 available to all of the parties here.

03:22 3 But, hopefully, it's evident, it's not an
03:22 4 exercise of putting numbers in a spreadsheet. You know, the
03:22 5 whole, one might say, spirit of what I'm doing is to check for
03:22 6 consistency with all the numbers. You can't just put in a
03:22 7 number and another one spits out.

03:22 8 So specifically, as I had said, I have looked at
03:22 9 BP's seismic interpretation and, indeed, their seismic
03:22 10 interpretation that had a larger reservoir area. That seismic
03:22 11 interpretation said that at the Macondo well you'd encounter
03:22 12 over 140 feet of hydrocarbon-bearing sand.

03:23 13 You didn't. It was 93 feet, almost exactly.
03:23 14 The P50 seismic interpretation.

03:23 15 So, indeed, as Dr. Kelkar has testified, that
03:23 16 narrows the uncertainty. That high reservoir area case is
03:23 17 implausible. We know it's wrong. We have additional data.

03:23 18 So, of course, you can put numbers into a
03:23 19 spreadsheet, but you have to do it with a considerable amount
03:23 20 of care.

03:23 21 **BY MR. BROCK:**

03:23 22 **Q.** One of the issues, with regard to the seismic survey or
03:23 23 data, is that from looking at the data itself, you can't
03:23 24 precisely know the depth of the reservoir; correct?

03:23 25 **A.** You have a reasonable inference of the depth. Actually,

03:23 1 the thing that's the major limitation of the seismic survey is
03:23 2 that you can't discern individual sandstone -- I'm sorry --
03:23 3 hydrocarbon-bearing sandstone channels.

03:23 4 Q. So the point I'm coming to is that with regard to the
03:24 5 Macondo reservoir, did the depth of the reservoir turn out as
03:24 6 predicted in the modeling that was done before the well was
03:24 7 drilled?

03:24 8 A. Yes. It was almost exactly what the P50 case was. You
03:24 9 know, the base case, the most likely case, turned out to be, I
03:24 10 would say, even more likely post-drilled, and you could exclude
03:24 11 some of the very high area cases.

03:24 12 Q. As a reservoir engineer, does that give you additional
03:24 13 confidence in the modeling that was done prior to drilling the
03:24 14 well?

03:24 15 A. Yes. I mean, if you make a prediction, you say your most
03:24 16 likely thickness is, I think, as I recall, is 96 feet, and you
03:24 17 encounter 93 feet when you've drilled through 13,000 feet of
03:24 18 rock, that's a tremendous achievement; and it gives you a lot
03:24 19 of confidence in the quality of that seismic survey and its
03:24 20 interpretation.

03:24 21 Q. Okay. Thank you.

03:24 22 Changing topics. How does a reservoir engineer use
03:25 23 rock-mechanic testing and analysis like the work that
03:25 24 Weatherford did in analyzing the core samples for BP?

03:25 25 A. Okay. Well, the first thing I said, while we're talking

03:25 1 about spreadsheets, is anyone with any expertise in this area
03:25 2 doesn't just pluck a number from a spreadsheet. All right.
03:25 3 They look at the data very carefully. They evaluate that data.
03:25 4 They look at possible ranges that are consistent with the
03:25 5 measured data.

03:25 6 And then they input those numbers into reservoir
03:25 7 engineering calculations.

03:25 8 And then, as I described in Chapter 5 of my report,
03:25 9 you look for mutual consistency. Do the numbers that you've
03:25 10 put in make sense in the light of all the data, particularly
03:25 11 production and pressure data?

03:25 12 Q. Based on the things that you've just described, did you
03:25 13 conduct your own independent analysis to ascertain the
03:25 14 compressibility of rock at the Macondo reservoir?

03:26 15 A. Indeed, I did. I performed my own analysis, looking again
03:26 16 at the raw data, not just plucking a number, as I said, out of
03:26 17 a spreadsheet, but looking exactly at how the pore volume would
03:26 18 change from the initial pressure to my calculated final
03:26 19 reservoir pressure, taking those numbers -- and the numbers are
03:26 20 actually in page 60 of my expert report -- and I arrived at a
03:26 21 determination of pore volume compressibility that's slightly
03:26 22 lower than the numbers that were determined by Professor
03:26 23 Zimmerman, but only slightly lower?

03:26 24 Q. Now, I want to turn your attention to TREX- -- well, let
03:26 25 me just ask a couple questions first.

03:26 1 You were asked on cross-examination whether
03:26 2 Dr. Kelkar's article about Gulf of Mexico compressibility
03:26 3 ranges is applicable to Macondo. Do you recall that?

03:26 4 A. Yes.

03:26 5 Q. All right.

03:26 6 **MR. BROCK:** I want to call out 011560.4.1. I've got
03:27 7 a couple of call-outs here.

03:27 8 **BY MR. BROCK:**

03:27 9 Q. Is this the article that you were talking about on
03:27 10 cross-examination?

03:27 11 A. Yes.

03:27 12 Q. And is this the article that is referenced in your report?

03:27 13 A. Yes.

03:27 14 Q. Now, if you look at the call-outs that we have here, do
03:27 15 you see that it describes: "For each parameter high and low
03:27 16 extreme values and medium value are determined according to the
03:27 17 extensive study in the Lower Tertiary reservoirs in the Gulf of
03:27 18 Mexico"?

03:27 19 Do you see that?

03:27 20 A. Yes, I do.

03:27 21 Q. When a paper like this refers to high and low extreme
03:27 22 values, what does that refer to? What does that mean?

03:27 23 A. I would have thought that that would be the full range of
03:28 24 plausible values for pore volume compressibility.

03:28 25 So it may be as low as 1; but, frankly, you know,

03:28 1 that's extremely unlikely, and it may be as high as 10; and for
03:28 2 these particular reservoirs, you would consider that extremely
03:28 3 unlikely.

03:28 4 Q. Okay. Now, what geologic age is referred to in this
03:28 5 article?

03:28 6 A. Well, my understanding is -- and that's based on the
03:28 7 title -- is we go from the Middle Miocene, about the same
03:28 8 geological age as Macondo. And then as you go backwards in
03:28 9 geological time, you go deeper. So it's looking at fields of
03:28 10 around the geological age and around the depth of Macondo, and
03:28 11 some fields that are older and deeper as well.

03:28 12 Q. Okay. Let's see what Dr. Kelkar said about this article
03:28 13 when he testified to the Court yesterday.

03:28 14 MR. BROCK: Could we have page 34 of Dr. Kelkar's --
03:29 15 I think this is actually his deposition testimony.

03:29 16 BY MR. BROCK:

03:29 17 Q. You have reviewed Dr. Kelkar's deposition?

03:29 18 A. I've read it, yes.

03:29 19 Q. And do you see here, he's asked a question:

03:29 20 "Is another name for the geologic age of the Macondo
03:29 21 reservoir 'Lower Tertiary'?"

03:29 22 He says -- what does he say?

03:29 23 A. He's asked -- he says: "Lower Tertiary."

03:29 24 And he's the senior author of the paper. I assume he
03:29 25 knows, so, I want to say, defer to him as the author of the

03:29 1 paper on that.

03:29 2 Q. So the author of this article, Dr. Kelkar, on GoM
03:29 3 compressibility admits that Macondo is of the same geologic age
03:29 4 as the -- as the materials that are being studied in this
03:29 5 paper?

03:29 6 A. Yes. That's my understanding as well from reading the
03:30 7 paper.

03:30 8 MR. BROCK: That's all I have, Dr. Blunt. Thank you
03:30 9 very much.

03:30 10 THE COURT: I think you're done, sir. Thank you.

03:30 11 MR. CERNICH: Excuse me, Your Honor. Just
03:30 12 housekeeping. I had the wrong numbers on a couple of these
03:30 13 demonstratives, for the record.

03:30 14 THE COURT: Did you leave a digit off of one?

03:30 15 MR. CERNICH: Two of them. That's what I'm trying
03:30 16 to --

03:30 17 THE COURT: I thought you did, but I didn't want to
03:30 18 correct you. I figured you would figure it out on your own at
03:30 19 some point.

03:30 20 MR. CERNICH: That's why I'm a lawyer and not one of
03:30 21 those guys sitting in the chair.

03:30 22 I incorrectly labeled this one as D-2357B. I
03:30 23 meant to label it as D-23567B.

03:30 24 THE COURT: Just give it a brief description. This
03:30 25 is the?

03:30 1 MR. CERNICH: Oh, I'm sorry. This is a demonstrative
03:30 2 with Professor Blunt's integrated curve from his report.

03:30 3 THE COURT: Where you asked him some questions and
03:30 4 you put additional markings on that demonstrative; correct?

03:31 5 MR. CERNICH: Yes, Your Honor, that's right.

03:31 6 And the other one I left off a digit on it.
03:31 7 This is entitled "Pressure Curve Steepness Indication of
03:31 8 Permeability." I had incorrectly said D-2365B -- and I did it
03:31 9 again. It should be D-23565B. And this was one where we had
03:31 10 circled the 300 millidarcys on the slide and written in
03:31 11 "assumed flow rate of 45,000 stock tank barrels per day."

03:31 12 Thank you.

03:31 13 THE COURT: Okay. Those are noted.

03:31 14 MR. BROCK: Your Honor, as indicated earlier, at this
03:31 15 point, we will now play three videotapes, totaling about
03:32 16 22 minutes.

03:32 17 We have Mark Havstad, who was an engineer with
03:32 18 the Lawrence Livermore National Labs; Art Ratzell, who was the
03:32 19 Sandia National Labs director of facilities; and Trevor Hill,
03:32 20 who was an E&P engineering technical authority during the time
03:32 21 of the spill.

03:32 22 THE COURT: All right. It will take about 30 minutes
03:32 23 altogether, you said?

03:32 24 MR. BROCK: I think it's about -- it's a little less
03:32 25 than 25.

03:32 1 THE COURT: Okay. Very well.

03:32 2 (WHEREUPON, the videotaped deposition of **Mark Havstad**

03:32 3 was played.)

03:37 4 * * * * *

03:37 5 (WHEREUPON, the videotaped deposition of **Arthur**

03:37 6 **Ratzel** was played.)

03:39 7 * * * * *

03:39 8 (WHEREUPON, the videotaped deposition of **Trevor Hill**

03:39 9 was played.)

03:57 10 MR. BROCK: Judge Barbier.

03:57 11 THE COURT: Yes.

03:57 12 MR. BROCK: That concludes our tapes for today. I

03:57 13 did want to just mention the witness order for Monday in case

03:57 14 you were interested in that.

03:57 15 THE COURT: Okay. Is this the latest list that you

03:57 16 had provided, dated Monday evening?

03:57 17 MR. BROCK: Well, yes, sir.

03:57 18 We're going to go with Whitson as the next

03:57 19 witness. He was the one that we were subbing in for today.

03:57 20 Then we will follow in order after that: Zimmerman,

03:57 21 Gringarten, Merrill, and Zaldivar.

03:58 22 THE COURT: Okay. Very well.

03:58 23 MR. BROCK: And thank you for accommodating us this

03:58 24 afternoon.

03:58 25 THE COURT: Sure.

03:58 1 **MS. HIMMELHOCH:** And for clarification, Your Honor,
03:58 2 that's Tuesday, not Monday; correct?

03:58 3 **MR. BROCK:** Tuesday, yes. I'm sorry.

03:58 4 **THE COURT:** Tuesday. Don't come Monday, because the
03:58 5 marshals won't be here and won't let you. Okay?

03:58 6 **MR. BROCK:** We might just walk over anyway just to
03:58 7 say hello to the building.

03:58 8 **THE COURT:** Just out of habit, huh?

03:58 9 All right. Anything else? Any other matters
03:58 10 before we recess?

03:58 11 Okay. Everyone have a good -- what is it?
03:58 12 Columbus Day. I had to stop and think what holiday is Monday.
03:58 13 When you practice law, you probably don't even worry about
03:58 14 those types of holidays.

03:58 15 **MR. BROCK:** I can't ever remember taking Columbus Day
03:58 16 off. I know it's a holiday.

03:58 17 **THE COURT:** No. I didn't either when I practiced
03:58 18 law. When I got here, I found out everybody thought that was a
03:58 19 big holiday.

03:58 20 All right. We'll see everybody at 8:00 a.m. on
03:58 21 Tuesday morning.

03:59 22 **THE DEPUTY CLERK:** All rise.

05:03 23 (WHEREUPON, the proceedings were concluded.)

24 *****
25

1 *****

2 CERTIFICATE

3 I, Jodi Simcox, RMR, FCRR, Official Court Reporter
4 for the United States District Court, Eastern District of
5 Louisiana, do hereby certify that the foregoing is a true and
6 correct transcript, to the best of my ability and
7 understanding, from the record of the proceedings in the
8 above-entitled and numbered matter.

9
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11 *s/Jodi Simcox, RMR, FCRR*
12 Jodi Simcox, RMR, FCRR
13 Official Court Reporter
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