IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF CHEVRON USA, INC. FOR A NONSTANDARD SPACING AND PRORATION UNIT AND COMPULSORY POOLING, LEA COUNTY, NEW MEXICO. CASE NO. 15074

ORIGINAL

APPLICATION OF ENDURANCE RESOURCES, LLC FOR COMPULSORY POOLING AND NONSTANDARD SPACING AND PRORATION UNIT, LEA COUNTY, NEW MEXICO. CASE NO. 15084

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

Volume 1 of 2

February 20, 2014

Santa Fe, New Mexico

BEFORE: RICHARD EZEANYIM, CHIEF EXAMINER

This matter came on for hearing before the New Mexico Oil Conservation Division, Richard Ezeanyim, Chief Examiner, on Thursday, February 20 and Friday, February 21, 2014, 2014, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Porter Hall, Room 102, Santa Fe, New Mexico.

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INDEX

INDEX (Cont'd)

EXHIBITS OFFERED AND ADMITTED

(9:51 a.m.)

EXAMINER EZEANYIM: Now we go back to the last page. We have two cases remaining, but they are contested cases, and we are going to consolidate them for purposes of testimony.

Before I call this case, I need to make sure I understand the application before we proceed.

At this point, I call the consolidated cases. The first one is Case Number 15074, and this is the application of Chevron USA, Inc. for a nonstandard spacing and proration unit and compulsory pooling. This is in Lea County, New Mexico. This case is going to be consolidated with Case Number 15084, application of Endurance Resources, LLC for compulsory pooling and nonstandard spacing and proration unit, Lea County, New Mexico.

Before I call for appearances, I want to make some statements, which can help us sometimes, because of what I saw in this docket.

Take a seat, then, so I can say something else.

This case is -- the last case, then, says application of Endurance Resources for compulsory pooling. You can't pool a vacuum. The unit has not been formed. So compulsory pooling cannot come first.

I want to use this opportunity -- I don't want somebody to make that mistake. First of all, you tell me what -- because unless you are pooling 40 acres, then you can compulsory pool. Forty acre is a unit, a regular unit, statewide unit, but if you want to ask for an exception to that 40-acre unit, you have to first form it. If you don't form it, there is nothing to pool. I don't know. I hope you understand what I'm saying.

What I'm saying is that if you want to give -- say, for example, simply, you want to drill a horizontal well, 160-acre or, you know, whatever, 200-acre, 320-acre, whatever, you need to form that unit; get the exception. Once that is approved, then you can compulsory pool it. If you are in a JOA, I can't allow you to.

So if you say compulsory pooling, that seems to me that you are pooling in a vacuum. Then before you say, okay, nonstandard proration unit. So what I'm trying to say here is that it should have been the other way. You say you want to get that approved first? Then before you compulsory pool it -- you can only pool a unit. You can't pool anything else except a unit or a project area, like in this case.

So I want to say because I saw it, I don't want that mistake to happen again, because that's not

right. We want to get them right.

Am I making any sense?

Okay. Now, going further, in that case, too, I don't know whether we want to dedicate -- it's a contested case. I want to get this straight, so I can follow. Do we want, in that case, to form a 320-acre for this type of pool or 160-acre? What are we doing? So when you come in, you tell me what you want, but right now it's east half. That is your -- that's okay. I want to point them out. I don't want an answer now, but I want to point all these things out, so that when we start, somebody will tell me exactly how many acres you want in the project area. Because if you are asking for 160, you might be approved. If you are asking for 320, you might not. I don't know. It depends on what you tell me.

Okay. I've said what I want to say. I think this is for my own, you know, housekeeping purpose.

I read the cases into the record. Now I will call for appearances.

MR. FELDEWERT: May it please the Examiner, Michael Feldewert, with the Santa Fe office of Holland & Hart, appearing on behalf of the Applicant in Case Number 15074, Chevron U.S.A., Inc.

EXAMINER EZEANYIM: Any other appearances?

MR. FELDEWERT: I'm sorry. I have four witnesses.

EXAMINER EZEANYIM: Four witnesses.

Any other appearances?

MR. PADILLA: Mr. Examiner, Ernest L. Padilla for Endurance Resources in both cases that are consolidated, and I have five witnesses.

EXAMINER EZEANYIM: Very good. Any other appearances?

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe representing Kaiser-Francis Oil Company. I do not have any witnesses.

EXAMINER EZEANYIM: Any other appearances?

Come on, let's go.

Now, do we have any opening statements? It's a contested case. Do you want to do opening statements or --

MR. FELDEWERT: Sure.

EXAMINER EZEANYIM: -- can we just go ahead and go on with the case? Anybody want to do an opening statement?

MR. FELDEWERT: Mr. Examiner, I do have a brief opening statement.

EXAMINER EZEANYIM: Do you, Mr. Padilla?

MR. PADILLA: If Mr. Feldewert is going to do that, I will, too.

EXAMINER EZEANYIM: Okay. Good.

Okay. Who wants to go first? We have no preference. Anybody can go first.

OPENING STATEMENT

MR. FELDEWERT: I think one of them we've already touched on, Mr. Examiner, and that is the unusual aspect of this case, is that Chevron's here seeking a 160-acre nonstandard spacing and proration unit comprised of the south half-north half of Section 18. Whereas, Endurance is proposing an east half 320-acre spacing unit in Section 18. And as I understand it, a single horizontal well is going to be drilled in the east half-east half. I think there are some procedural and some advertising issues associated with that.

Secondly, Your Honor, Chevron's here because they first proposed the development of the north half of Section 18 back in November. They had a meeting with the parties. They had a disagreement on the well orientation. Chevron then filed its pooling application 30 days later, and only then did Endurance come forth and express a desire that it would drill a north-to-south well in Section 18. And they sent out

their well-proposal letter December 31st of 2013.

Chevron's north half acreage, Mr. Examiner, is fee. I think that's important, because the south half of this acreage is federal. And as you know, there is a preference with the BLM that, where possible, you develop the federal acreage independently of fee acreage. We can do that here.

There is a clear disagreement over the orientation of the well. Chevron is going to present data to you today that shows that an east-west trajectory in this particular section is preferable than a north-south direction. The other aspect of that, Your Honor, is Chevron's proposal will not require a mixing of fee and federal lands. It's not necessary here.

We're going to show you that in this particular area, there is no -- virtually no development. We have a new area here. Section 18, we're going to show you, is unique, Mr. Examiner. It has an anticline that runs north to south. And what I found out, in preparing for this case, is that when you have an anticline that runs north to south, your natural fracturing system is, likewise, going to be north to south because of the fold. So an east-to-west well is necessary to intersect those natural fractures.

The sand channels in this area tend to run

north to south, which means that an east-to-west well has a better chance of intersecting the access to the riverbed, that sweet spot. That's why Chevron believes east to west is the best option.

Endurance objects, and so, Your Honor, as matter of procedure, they're going to have to come forth and clearly show to you that waste is going to occur from our well, something that they're not going to be able to show.

They're going to put forth an EUR analysis, as I understand it, where they lump together various wells from an eight-township area, a very large area with different geology, different completion methods. They essentially are mixing apples and oranges in their study.

Chevron has, likewise, at your request at our pre-hearing conference, done an EUR analysis. But they focused their analysis on a developed area to the southwest of Section 18, one that's only three to seven miles away. While it's different from the anticline that we have in Section 18, which is a unique future -- but while it's different, they did an EUR analysis that is much more finite. They took an area that had common geology, that had common flow, that had common completion methods in the 2nd Bone Spring Sand so that

you could look at it from an apples-to-apples perspective and not an apples-to-oranges perspective. It allows you to do a better comparison of how east-to-west wells perform as compared to north-to-south wells. And what we're going to show you and what this study demonstrates is that east-to-west wells out perform north-to-south wells.

So Chevron wants to develop its fee acreage in the north half of Section 18 with east-to-west wells. They proposed first. They have a substantial interest here. They have a right to pursue their development plan. It makes sense given the unique nature of the geology.

And unless Endurance is able to come forth here with actual data that clearly establishes that waste will occur, then there is no reason why you should not allow Chevron to proceed with its development plan and grant their application.

EXAMINER EZEANYIM: Thank you very much.

OPENING STATEMENT

MR. PADILLA: Mr. Examiner, Endurance Resources operates in this area. This is the focus, you will hear, of their company, the Bone Spring, particularly, the 2nd Bone Spring Formation. Our presentation will focus on a localized area. Mr.

Feldewert misleads you when he says we are bringing information from all over the world. That is not the case here. It is very particularized. Chevron has participated with Endurance in a number of wells already in the immediate area.

The experience that Endurance has in operating and drilling wells in this area is exceptional. This is not an isolated proposal for Endurance. It is part of a program development, and this is where Endurance operates. You will hear of the success that Endurance has had. You will hear of the stress profile in terms of how you drill horizontal wells in Section 18 and the surrounding sections and what the success rate has been for those wells.

In comparing the east-west versus the north-south economics, you will see that drilling east-west is a losing proposition and is ultimately going to have resulting waste because oil will not be recovered. In your pre-hearing statement -- or pre-hearing conference that we had, you emphasized that you did not want to have one barrel wasted. Chevron's proposal will result in waste.

Now, you will see evidence this morning -- and in an earlier case, a geologist testified here of the success of the northwest-oriented wells -- the

north-south oriented wells versus east-west. That is exactly the case here, and it's not going to be any different. And that is what you will hear today.

EXAMINER EZEANYIM: Okay. Thank you.

Any other opening statements?

Okay. Both Applicants -- since you are 15074, you may start.

MR. FELDEWERT: Thank you, Mr. Examiner. We'll call our first witness, Mr. Jason Levine.

EXAMINER EZEANYIM: What's your name?

THE WITNESS: Jason Levine, L-E-V, as in Victor, I-N-E.

JASON LEVINE,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Levine, would you please identify by whom you are employed and in what capacity?

A. Mr. Examiner, I'm employed by Chevron as a petroleum landman.

Q. And have you previously testified before this Division?

A. Yes.

Q. At that time were your credentials as an expert

in petroleum land matters accepted and made a matter of public record?

A. They were, yes.

Q. And are you familiar with the application filed in this case?

A. I am.

Q. And are you familiar with the status of the lands in the subject area?

A. Yes.

MR. FELDEWERT: Mr. Examiner, I would tender Mr. Levine as an expert witness in petroleum land matters.

EXAMINER EZEANYIM: So qualified.

Q. (BY MR. FELDEWERT) Would you please turn to what's been marked as Chevron Exhibit Number 1?

EXAMINER EZEANYIM: Excuse me.

I hope you don't have any objection.

MR. PADILLA: No, no objection.

Q. (BY MR. FELDEWERT) Is this an approved APD for the well that Chevron has proposed in its application?

A. Yes.

Q. And it was approved by the Division in November; is that correct?

A. Yes, sir.

Q. And this identifies the API number for your

proposed well and also the pool code for this proposed well; does it not?

A. Yes, it does.

Q. And what does the company seek under this application?

A. Chevron seeks approval of a 157.71-acre nonstandard spacing and proration unit comprised of the south half of the north half of Section 18.

EXAMINER EZEANYIM: Is this an irregular section? Is that an irregular section?

THE WITNESS: Yes.

EXAMINER EZEANYIM: So 157 what?

THE WITNESS: 157.71.

MR. FELDEWERT: Mr. Examiner, I think the acreage is identified on the second page of this exhibit, under the dedicated area.

EXAMINER EZEANYIM: Oh. On Exhibit Number 1?

MR. FELDEWERT: Exhibit Number 1, the second page, under the dedicated areas, 157.71.

EXAMINER EZEANYIM: Okay.

Q. (BY MR. FELDEWERT) And then you're also seeking to pool the mineral interests in the Bell Lake Bone Spring north pool under this acreage, Mr. Levine?

A. Yes, sir.

Q. Now, I think this is important. You're seeking -- this is standard spacing for this pool, correct, standard statewide rules?

A. Yes.

Q. And that would be 40-acre spacing?

A. That's correct.

Q. And you're seeking to only pool and have advertised to pool a south half of the north half of Section 18?

A. Yes, that's correct.

Q. As a nonstandard spacing unit?

A. Yes.

Q. Is the north half of Section 18 comprised of fee lands?

A. Yes.

Q. And if I turn to what's been marked as Chevron Exhibit Number 2, does this provide an ownership breakdown of, first, the north half, the fee acreage, in Section 18, and then, at the bottom, does it provide a total ownership breakdown in the entire section?

A. Yes, it does.

Q. Did Chevron propose its well to the other working interest owners identified in the fee acreage in the north half of Section 18?

A. Yes.

Mr. Examiner, on November 12th of 2013, Chevron sent well proposals to all the mineral interest owners.

EXAMINER EZEANYIM: What date is that? November what?

THE WITNESS: Sir, November 12th, 2013.

Q. (BY MR. FELDEWERT) Mr. Levine, if I might interrupt. I'll have you turn to what's been marked as Chevron Exhibit Number 3. Is that the well-proposal letter you're talking about?

A. Yes, sir.

Q. And it provides the dates?

A. Yes.

EXAMINER EZEANYIM: Okay.

Q. (BY MR. FELDEWERT) And is this the letter that was sent to the other interest owners in the north half of Section 18?

A. Yes. This letter, except for the names of the parties, was sent to all the mineral interest owners in the north half of Section 18.

Q. After this letter was sent out as certified mail to the interest owners, did Chevron undertake additional efforts to reach an agreement on its proposed well on this fee acreage?

A. Yes.

Mr. Examiner, on November 20th of 2013, merely eight days after the well proposal was initially sent, a meeting was organized in Chevron's offices, and the guests for that meeting were folks who you're going to meet later from Endurance.

So from Chevron, Ken Schwartz, a geologist, who will be testifying later, attended, and I, myself, attended. And then from Endurance, the atttendees were Jason South, Randall Harris and Don Ritter.

Q. And what happened at the meeting that you hosted at Chevron's offices on November 20?

A. Endurance presented a slide show to Ken Schwartz and I, and it discussed some things, including, one, a trade proposal in lands. They're located in a township a few miles away from our Bell Lake well. But their slide show also displayed some maps. As I recall, there was an isopach map and a porosity map, and Endurance, based on those maps, encouraged Chevron to drill a north-to-south oriented well, as opposed to the east-west oriented well.

Q. So they asked that Chevron drill a stand-up well?

A. Yes, sir. Endurance asked that Chevron drill a stand-up well.

Q. And did Chevron review the information that

Endurance presented to them at the November 20th meeting?

A. Yes. Chevron dutifully reviewed that information and then realized that -- and you'll hear this from my petroleum engineer and geologist -- that a west-to-east orientation was more appropriate in this particular area.

Q. And did you have -- did the company have additional discussions with the other interest owner, Mr. Westall?

A. Yes. Mr. Westall was contacted by Chevron after the well proposal was sent to him. We asked Mr. Westall if he would be interested in leasing his mineral interest to Chevron. He declined, and then ultimately he said that he would not be interested in participating in Chevron's well.

Q. Now, after you sent out your well-proposal letter and you had this meeting at their offices -- in Houston, I guess, right?

A. Correct, in Houston, Texas.

Q. -- and reviewed Endurance's request that Chevron drill a stand-up well, did the company then proceed to file its pooling application?

A. Yes. On December 12th of 2013, a month after the initial well proposal was sent, Chevron filed its

application.

Q. Does Chevron own an interest in each tract in this that will penetrate from the south half to the north half of Section 18?

A. Yes. It's critical to understand that Chevron owns an undivided interest in all of the north half.

If you'd like, Mr. Examiner, we could revisit Exhibit 2. But, nevertheless, Chevron owns an interest in every tract in the north half.

Q. After filing this pooling application in December, did the company have a rig available at that time to drill the well?

A. Yes, it did.

Q. And did the company proceed to commence drilling of the well?

A. Yes. Around Christmas, December 25th, 2013, Chevron had a rig available to drill this Bell Lake well. And at that time, one of the Chevron's leases had a June 2014 expiration.

So, Mr. Examiner, you can imagine the urgency with which Chevron wanted to proceed given that there was an imminent lease expiration. Chevron wanted to begin to commence operations to assist in holding that particular lease.

Q. Did the company then begin drilling the

vertical portion of that well to assist in holding the leases?

A. Yes. Chevron drilled from the surface to about 5,000 feet below the surface and then set intermediate casing.

Q. Did you stop at that point?

A. Correct.

Q. While you're on the subject of leases, did the company recently obtain an extension of its north-half fee lease?

A. Yes. Chevron recently extended that lease through 2016.

Q. Did the company eventually receive a formal well proposal from Endurance in which Endurance proposed to drill a north-to-south well?

A. Yes. On December 31st, 2013, after Chevron had commenced the vertical portion of its well, Endurance sent a well proposal to Chevron.

Q. If I turn to what's been marked as Chevron Exhibit Number 4, does that identify the formal well proposal it was sent by Endurance, dated December 31st, 2013?

A. Yes.

Q. And if I've got my timeline correct, that was six weeks after Chevron proposed its well, correct?

A. Correct. Chevron proposed its well November 12th. Endurance proposed its well December 31st.

Q. And that was two weeks after filing your pooling application?

A. Yes, that's correct.

Q. And roughly a week after you commenced drilling the vertical portion, that's when you got this competing well proposal?

A. Yes, that's correct.

Q. Now, let me ask you something. You said you stopped drilling at that point. Why did you stop drilling at that point?

A. Chevron wanted to be respectful of this process and stopped drilling. And given the chance that Endurance had proposed a well -- a competing well, we didn't want to have a situation where Chevron had expended all these funds to drill its well and then for some slight the NMOCD decided a north-to-south orientation was more appropriate. We decided it was prudent to stop at 5,000 feet below the surface.

Q. Now, let me ask you something. Prior to receiving this letter in December, I think you testified -- let me ask you this: Prior to receiving this letter in December, had Endurance indicated that it desired to go out and drill a north-to-south well?

A. No, sir.

Q. Had they, instead, been trying to encourage Chevron to drill a north-to-south well?

A. Yes. Endurance was trying to encourage, up until December 31st, Chevron to drill in the north-to-south orientation.

Q. So upon receipt of this letter, to your knowledge, this is the first time that Endurance said they wanted to go out and drill a north-to-south well?

A. Yes.

Q. And is that, then, when you stopped the drilling of the vertical portion of your well and moved the rig off location?

A. Correct.

Q. Now, the other thing about this letter is that if I look at the rate line up there, it seeks to, as you understand this letter, to form an east half-east half stand-up unit, correct?

A. Correct.

Q. Not an east-half stand-up unit?

A. Correct.

Q. And, in fact, their well proposal is for 660 feet from the east line, correct?

A. That's correct.

Q. Did the company -- did Endurance eventually

provide a JOA for their proposed well?

A. Yes. Endurance sent Chevron a JOA, Joint Operating Agreement, for its well in the east half-east half of Section 18.

Q. And what overhead rates did Endurance propose in the JOA that you received, I guess sometime in January?

A. Yes, that's correct. The rates provided by Endurance -- the drilling rate was $9,400 per month, and the producing rate was $1,000 per month.

Q. What overhead rates had Chevron produced for its planned development?

A. 6,500 for drilling and 650 for producing.

Q. So much lower than Endurance?

A. Yes, sir.

Q. Does Chevron request that its rates be incorporated into any order from this hearing?

A. Yes.

EXAMINER EZEANYIM: I need to get the information on those overhead rates. Chevron is 650?

THE WITNESS: Mr. Examiner, Chevron proposes $6,500 per month for drilling and $650 per month for producing.

EXAMINER EZEANYIM: Okay. And then you say that -- well, you're not going to talk for them.

They'll tell me what it is. I don't want to take your word for it. They will tell me what their overhead rate is.

THE WITNESS: (Indicating.)

Q. (BY MR. FELDEWERT) Now, looking back at Chevron Exhibit Number 2, does Endurance's proposed stand-up spacing unit require the inclusion of federal acreage in the south half of Section 18?

A. Yes.

So, Mr. Examiner, on Exhibit 2, which shows that the south half is comprised of federal lands, there are actually -- there are two different leases.

Q. Two federal leases in the south half?

A. Two federal leases cover the south half.

Q. Who is the record title owner of those leases?

A. ConocoPhillips.

Q. And did you ascertain the ownership of the -- today's ownership of the two federal leases covering the south half of -- the federal leases in the south half of Section 18?

A. Yes, sir. Prior to the hearing, Chevron hired a broker who examined the state and federal records, and based upon his analysis, he furnished those records to one of Chevron's title attorneys who believes that the ownership in the south half is comprised of the

following: ConocoPhillips Company owns two-thirds -- sorry. Excuse me. ConocoPhillips owns one-third of the south half, and BTA Oil Producers owns two-thirds of the south half.

Q. In those federal leases?

A. In those federal leases.

Q. Now, in light of that, what will be required before Endurance could possibly drill its proposed stand-up well?

A. Endurance will need a federal permit and a communitization agreement, as well as a voluntary agreement of all the parties or an order from your office.

Q. Now, Chevron's lay-down well only involves the fee acreage?

A. That's correct.

Q. And you have your approved permit to drill?

A. Yes, as shown on -- I believe it's Exhibit 1. Chevron already has a permit approved by the State of New Mexico to proceed with the vertical portion of its Bell Lake well.

Q. Is the company prepared to finish its well once it receives the pooling order from the Division?

A. Yes, sir.

Q. Can the federal acreage in the south half of

Section 18 still be developed on a stand-up basis if that's what Endurance or the interest owners desire without involving the north-half fee acreage?

A. Yes. There are or two ways to develop the federal acreage in the south half of Section 18. On the one hand, Endurance could drill a short stand-up lateral in the southeast quadrant of Section 18, and then option two is that Endurance could combine the land in the south half of Section 18 with Section 19, which is immediately south of Section 18. And Section 19 is comprised of all of fee lands.

Q. All fee or all of federal?

A. Sorry. All of federal. Let me restate that clearly again.

The south half is comprised of Section 18 of federal lands, and Section 19 is also comprised of federal lands. It's a perfect marriage of Section 19 and the south half of Section 18 because they're both comprised of federal lands.

Q. And, in fact, Endurance recently proposed a well in the 2nd Bone Spring Sand in Section 19?

A. Yes, sir.

Q. If I turn to what's been marked as Chevron Exhibit Number 6 -- I'm sorry -- Exhibit Number 5, is that a well-proposal letter that Endurance sent to

Chevron in January proposing a development well in Section 19?

A. Correct. Yes.

On January 7th, 2014, Mr. Examiner, Endurance sent Chevron a well proposal for the east half of the east half of Section 19, which is comprised of federal lands.

Q. And your point is that if they really want a stand-up well in the south half of Section 18, they could extend that well from Section 19 into the south half of Section 18 and combine the federal acreage and develop that independent of the fee acreage?

A. Yes.

So, Mr. Examiner, the acreage in the north half of Section 18 can be independently developed from the south half of Section 18 because the south half is comprised of federal lands, and Section 19 is also comprised of federal lands. So Endurance could drill its well in the east half of the east half of Section 19 traversing through the south half of Section 18, because it's also comprised of federal lands.

EXAMINER EZEANYIM: Right. Excuse me. This is important, because I didn't look at Section 19. What is the letter -- because I don't have time to read them now. What is the nature of the letter to you of

January 7th? Summarize it.

THE WITNESS: Yes. The letter indicates that Endurance is going to drill a Bone Spring well in the east half-east half of Section 19. It's comprised of federal lands, and it would cover a 160-acre proration unit on the east half-east half. It would be a stand-up well.

EXAMINER EZEANYIM: So that is federal land. Chevron has an interest. That's why they didn't fight you.

THE WITNESS: Absolutely. Yes, sir.

EXAMINER EZEANYIM: And there is no mention in this letter about combining the south half in 18 -- south half of 18.

THE WITNESS: That is correct. In the letter from Endurance to Chevron, there was -- no mention was made that Endurance would be interested in combining the south half of Section 18 with Section 19.

EXAMINER EZEANYIM: So this letter is really irrelevant. They just want to propose a well in Section 19, but because of your interest, they wrote to you they are proposing a well.

Does this have any impact on the hearing today? I thought they were trying to combine the south half with some part of the -- the south half of 18 with

some part of 19, you know. But I think they notified you because they're an operator, I think -- I don't know -- in that Section 19. They wanted to notify Chevron because of your ownership. They are proposing a different well. Not this well, right? This proposal is not for the well in question today, right?

THE WITNESS: That is correct.

EXAMINER EZEANYIM: That is a different well?

THE WITNESS: Yes, sir. The purpose of introducing this exhibit is to indicate that the fee lands in the north half of Section 18 could be independently developed from the south half of Section 18.

EXAMINER EZEANYIM: Yeah. It's important that I ask that question to get what the point was. Okay. Go ahead.

Q. (BY MR. FELDEWERT) Mr. Levine, did Chevron undertake an effort to identify the leased mineral interest owners in the 40-acre tract surrounding this proposed nonstandard spacing unit on the fee acreage?

A. Yes, sir.

Q. And did the company include those known mineral interest owners in the notice of this hearing?

A. Yes. We notified the proper parties.

Q. And if I turn to Chevron Exhibit Number 6, is that an affidavit prepared by my office with attached letters providing notice to the affected parties?

A. Yes, sir.

Q. Now, you mentioned that ConocoPhillips is the record title owner of the federal leases in the south half of Section 18 and the current interest owner in those federal leases. Was ConocoPhillips, as an offset, notified of this application?

A. Yes. ConocoPhillips was notified.

Q. And did the company have discussions with ConocoPhillips about its proposed well?

A. Yes. I spoke with ConocoPhillips, and ConocoPhillips did not object to Chevron drilling in an east-west orientation.

Q. Now, the company also received a letter from the other interest owners in the south half of Section 18, BTA, objecting to your proposed well, correct?

A. Yes. I received that letter.

Q. And BTA expressed a desire for a stand-up well in the south half of Section 18?

A. Yes, sir.

Q. And if they still want a stand-up well, again, their desire could be accommodated by extending a stand-up well from Section 19 into the south half of

Section 18 in developing the federal acreage together?

A. Yes, sir. So, again, Section 19, comprised of federal lands, could be developed also with the south half of Section 18.

Q. That would essentially be a mile-and-a-half lateral, correct?

A. Yes.

Q. And is Chevron -- I think -- I'm sorry. I think you've already testified that Chevron is ready to proceed with the drilling of its well as soon as the Division approves the pooling order?

A. Yes, sir.

Q. Were Exhibits 1 through 5 prepared by you or compiled under your direction and supervision?

A. Yes, they were.

MR. FELDEWERT: Mr. Examiner, I'd move admission into evidence of Chevron Exhibits 1 through 6, which includes my affidavit.

EXAMINER EZEANYIM: Any objection?

MR. PADILLA: I'm sorry?

EXAMINER EZEANYIM: Any objection?

MR. PADILLA: No objection.

EXAMINER EZEANYIM: Exhibits 1 through 6 will be admitted.

(Chevron USA, Inc. Exhibit Numbers 1

through 6 were offered and admitted into evidence.)

MR. FELDEWERT: That concludes my examination of this witness.

EXAMINER EZEANYIM: Thank you, Mr. Feldewert.

Mr. Padilla?

CROSS-EXAMINATION

BY MR. PADILLA:

Q. Mr. Levine -- am I pronouncing correctly?

A. Levine.

Q. Mr. Levine, who has a controlling interest in the north half of Section 18?

A. Tritex Energy A, Limited Partnership

Q. Chevron doesn't have the controlling interest; is that right?

A. That's correct.

Q. At the time you spudded your well, had you acquired any interests other than the one that Chevron held at that time?

A. No, sir.

Q. You had not acquired any interest; that's correct, right?

A. That's correct.

Q. Had you notified anybody at that time of your

well proposal?

A. Yes.

Q. Who?

A. Would you repeat what time is [sic]?

Q. Who had you notified about drilling your well at the time that you spudded your well?

A. We had notified all the mineral interests of record in the north half of Section 18.

Q. Had you already had a meeting with Endurance Resources at your offices on November 18th?

A. No. The meeting was held on November 20th.

Q. You're sure about that?

A. Yes.

Q. And according to your testimony, you started your well on December 31st?

A. December 25th. Chevron commenced the vertical portion of its well from the surface to 5,000 feet.

Q. And you testified that you did that because you had a general problem with an expiring lease; is that right?

A. Yes.

Q. Under your lease, did you have an option to extend that lease?

A. No, sir.

Q. You didn't have an option to extend the lease

at the time you started your well?

A. We had a preferential right to acquire a lease if another -- if a competitor tried to top leash Chevron.

Q. When did you seek an extension of the lease -- or why did you obtain an extension of the lease once you spudded the well?

A. Because we wanted to respect the NMOCD process, and given that the hearing is today -- it's February -- we were concerned that perhaps an order wouldn't be rendered until after the lease would expire.

Q. So sometime after June of 2014? Is that what you're saying? It would take perhaps that long for the OCD to issue an order?

A. Yes.

Q. Had you done anything to exercise your preferential right to a lease?

A. Yes. Chevron extended the lease that was going to expire in June of 2014.

Q. Did you get at an AFE from Endurance prior to November 27th?

A. No.

Q. Did you ever get an AFE from Endurance?

A. Yes, sir.

Q. When?

A. December 31st, 2013.

Q. When did you file an application for compulsory pooling with the OCD?

A. December 12th, 2013.

Q. Did you notify at your November 20th meeting with Endurance that you were going to file a compulsory pooling case against them?

A. No.

Q. What negotiations had occurred to form or to drill a well east-west or north-south with Endurance prior to your filing an application for compulsory pooling?

A. A meeting was held in Chevron's offices in Houston, Texas on November 20th prior to Chevron filing the forced pooling application. That meeting lasted for about an hour and a half. It sounds like there were some negotiations that occurred and discussions about the orientation of the well in Chevron's offices.

Q. And did Chevron do anything to follow up about solving either a north-south or an east-west well other than filing a compulsory pooling application in December?

A. Yes.

Q. What did you do?

A. Spoke with Jason South. Ken Schwartz, my

colleague, also spoke with employees with Endurance.

Q. How many times?

A. At least once or twice.

Q. Was there any written correspondence back and forth, exchange of information, geologic information that Chevron made to Endurance?

A. I can't testify to that -- I'm not a geologist -- but my geologist might be able to testify if he shared geological information with Endurance.

Q. Mr. Levine, you were sort of at the wheel in drilling this well, right?

A. Would you describe what at the wheel means?

Q. In charge.

A. I'm not in charge, no.

Q. Well, who was the front person at Chevron in the meeting with the Endurance group that you met with on November 20th? You were one of them, right?

A. Yes. Ken Schwartz, I would describe, as my boss. So Ken Schwartz is here today to talk.

Q. Do you know if Mr. Schwartz conveyed any geologic information to Endurance indicating that an east-west well was better?

A. I would defer to Mr. Schwartz to answer that question.

Q. I'm just asking whether you know whether any of

that information was conveyed from Chevron to Endurance?

A. I'm not going to speculate whether there was information conveyed by Mr. Schwartz to Endurance.

Q. The answer is simple. You can tell me yes or no.

MR. FELDEWERT: Object.

A. I do not know.

EXAMINER EZEANYIM: Counselor, rephrase your question.

Q. (BY MR. PADILLA) You testified about overhead rates. How many wells does Chevron operate in the immediate area of Section 18?

A. It operates no wells in Section 18, except for the vertical portion of the well that it has recently drilled.

Q. And do you operate any wells in Section 19, to the south?

A. No.

Q. Have you participated with Endurance on any wells in Section 19?

A. In Section 19? Not yet.

Q. Endurance is proposing to drill two wells in Section 19; is that right?

A. No. My understanding, based upon the well proposal, is that Endurance desires to drill one well in

the east half-east half of Section 19.

Q. Have you elected to participate in that well?

A. Chevron has not yet made a decision.

Q. And that's a north-south well; is that right?

A. Yes, sir.

Q. Have you participated in any wells with Endurance in Section 20?

A. No.

Q. How about in Section 30?

A. I can't seem to recall.

Q. Do you know whether any wells are drilled in Section 30?

A. I can't seem to recall.

Q. How about Section 29?

A. Yes.

Q. You've participated in Endurance wells in Section 29?

A. I seem to recall that Caza Petroleum is an operator that has drilled a well in Section 29. Chevron and Endurance are nonoperators and entered into a Joint Operating Agreement with Caza Petroleum as operator.

Q. And the Caza well is a north-south well, right?

A. Yes, sir.

Q. Do you operate wells in Section 24?

A. I don't --

EXAMINER EZEANYIM: Counsel, I would like to know -- I'm not fully comfortable. Why are we going into this even as far back as Section 24? What are we trying to establish? Please forgive me if I'm not following. Why are we doing that?

MR. PADILLA: Well, you know, he testified that east-west wells were -- is a better proposal in this case.

EXAMINER EZEANYIM: Uh-huh.

MR. PADILLA: And I'm just trying to see if Chevron is participating in any wells on a north-south basis in the immediate area, and that's the conflict. So that's where I'm going.

EXAMINER EZEANYIM: Okay. Thank you. Go ahead.

MR. FELDEWERT: I guess I'm going to offer an objection. He said Section 24. Can you identify the township and range, so we all know what we're talking about? Is that what you're talking about?

MR. PADILLA: That's fair. 23 South, 44 East.

THE WITNESS: Yes.

Q. (BY MR. PADILLA) You're operating a well there in Section 24?

A. Yes.

Q. Is that north-south or east-west?
A. It is north-south.
Q. Do you have a well -- any wells in Section 23?
A. Of what township?
Q. 23 South, 43 East?
A. Yes.
Q. You have two wells there, don't you?
A. Yes.
Q. And they're north-south, correct?
A. Yes.
Q. Did you have a well in Section 25, 23 South of 33 [sic] East?
A. Yes.
Q. And that's north-south, also, right?
A. Yes.

MR. PADILLA: That's all the questions I have.

EXAMINER EZEANYIM: Thank you very much.

Any other cross or re-examine?

MR. FELDEWERT: No.

EXAMINER EZEANYIM: Jim Bruce? Where is Jim?

MR. FELDEWERT: He told me he was leaving.

EXAMINER EZEANYIM: He just entered an appearance?

MR. FELDEWERT: He just wanted our pretty package, and then he left.

EXAMINER EZEANYIM: Oh, okay. That's easier for me.

CROSS-EXAMINATION

BY EXAMINER EZEANYIM:

Q. Let's go to Exhibit Number 2. I want to establish ownership interest. The north half is fee? All the north half is fee? The controlling interest is covered by Tritex?

A. Yes.

Q. What is the relationship with Tritex?

A. So my understanding is that Tritex Energy A, Limited Partnership is an affiliate of Endurance Resources, LLC.

Q. But you're going to two [sic] percent interest in the north half?

A. Yes, sir.

Q. When you were doing this -- oh, okay. Because they are partners with Endurance. Did you talk to Tritex at all?

A. Sir, Tritex Energy A, LP, for purposes of this hearing, I think it's safe to say that they're probably identical to Endurance Resources, LLC.

Q. So Tritex is equal to Endurance?

A. Yes, sir.

Q. I'm trying to see if there is another land question here for you.

Okay. Now, on the well that was started on December 25th, the target is -- is that the -- is that the Bone Spring?

A. Yes, sir.

Q. Bone Spring. And you stopped at 5,000 feet? You just stopped right there?

A. Chevron stopped at 5,000 feet and set intermediate casing.

Q. And where are you going? Let's say it's approved to continue. Where are you going?

A. Our target is the Bone Spring Formation.

Q. So you are about close to kickoff?

A. (Indicating.)

Q. You are about close to where you kick off into the Bone Spring?

A. I think we need to drill a little further --

Q. Drill to 7,000?

A. Yeah. And then --

Q. ConocoPhillips -- I don't see ConocoPhillips. Where is ConocoPhillips in this? ConocoPhillips doesn't have anything in the north half?

A. That's correct.

Q. And you testified they didn't object to you drilling your well?

A. Yes, sir.

Q. Why did you talk to them? They don't own anything there.

A. They own an interest in the south half.

Q. Yeah, I see that. They own interest in the south half. Okay.

Now, your well will be on a standard -- within the completed interval?

A. Yes.

Q. I don't find any of the information on the Form C-102. Did we go through it? I forgot.

A. Yes, sir, Exhibit 1.

Q. Is there anybody that should get notice that didn't get notice?

A. No, sir.

Q. Now, let's see. What is the total for AFE? Let me see. Is it in there?

A. Sir, if you --

Q. Completed well costs?

A. Yes. If you go to Exhibit 3, on November 12th, 2013, Chevron had -- if you go to the bottom of the page, the total, I will add that that total has been revised.

Q. To what? To what?

A. My colleague, Sean Cheben, will testify to that, sir.

Q. So it's a different number?

A. Yes, sir. It's lower.

MR. FELDEWERT: Mr. Examiner, that particular exhibit we haven't gotten to, but it's Exhibit Number 7.

EXAMINER EZEANYIM: Oh, okay. So I can get the well costs.

MR. FELDEWERT: You will get that, uh-huh.

EXAMINER EZEANYIM: Okay. Very good.

Okay. I have nothing further for you. Thank you.

THE WITNESS: Thank you.

MR. FELDEWERT: Mr. Examiner, with your permission, I'd call our next witness, Sean Cheben.

EXAMINER EZEANYIM: At this point I think it's important that all witnesses stand up, and we'll swear them in, do it at the same time, and then we can continue. We need to get this done today.

Start from here (indicating) and state your name fully for the record, and then you may be sworn.

MR. CHEBEN: Sean Cheben.

MR. SIGMUNDIK: Zachary Sigmundik.

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MR. SCHWARTZ: Ken Schwartz.
MR. LEHMAN: Lyle Lehman, L-E-H-M-A-N.
MR. HARRIS: Randall Harris.
MR. SOUTH: Jason South.
MR. SIRGO: Manny Sirgo.
MR. RITTER: Don Ritter.
EXAMINER EZEANYIM: You may swear them.
(Witnesses sworn.)
EXAMINER EZEANYIM: Call your next witness.

SEAN CHEBEN,

after having been first duly sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Would you please state your full name for the record, identify by whom you're employed and in what capacity?

A. My name is Sean Cheben. I'm employed by Chevron as a facilities engineer.

Q. And how do you spell your last name?

A. It's C-H-E-B, as in Bravo, E-N, as in November.

Q. Now, you have previously testified before this Division as an expert in petroleum facilities engineering?

A. Yes, I have.

Q. And at that time were your credentials accepted and made a matter of public record?

A. Yes, they were.

Q. Are you familiar with Chevron's well proposal for its fee lands in the north half of Section 18?

A. I am.

Q. And have you examined the AFE that was developed by Chevron for its well?

A. I have.

Q. Have you also examined the AFE that was submitted by Endurance for its rates proposed in the east half-east half well?

A. I have.

MR. FELDEWERT: Mr. Examiner, I would tender Mr. Cheben as an expert witness in petroleum facilities engineering.

EXAMINER EZEANYIM: He is so qualified.

Q. (BY MR. FELDEWERT) Mr. Cheben, Chevron proposed its well, I guess, over three months ago, correct?

A. Correct.

Q. Has the company had an opportunity to recently examine and update its AFE for the proposed well?

A. We have.

Q. If I turn to what's been marked as Chevron Exhibit Number 7, is that the revised AFE for its

proposed well?

A. Yes, it is.

Q. It contains three pages; does it not?

A. It does.

Q. Now, first off, please explain -- and this is a little more detail than you normally see in an AFE. Would you please explain how this AFE is organized?

A. Sure.

As Mr. Feldewert stated, this AFE is comprised of three pages. The first is a cost estimate from our drilling department, and the total can be found on the bottom, right-hand corner of the page. The second page is the cost estimate from our completions department, and, again, the total can be found in the bottom, right-hand page. I apologize for the small font. The third page was completed by our facilities group, and the total can be found at the top of the page. In all three cases, it's circled.

Q. Okay. Now, let me ask you this: Did you do the math to add all three of those numbers up for the Examiner?

A. Yes.

Q. Would you give him the total number now for this revised AFE?

A. The total cost is 8.452 million.

EXAMINER EZEANYIM: 8.452?

THE WITNESS: Yes, sir.

Q. (BY MR. FELDEWERT) And that's comprised by the number at the bottom of the right-hand corner of the first page, the bottom of the right-hand corner of the second page, and then the bolded number at the top of the third page; is that correct?

A. That's correct.

Q. Now, with respect to this new figure, what has been revised from the proposal that was submitted over three months ago?

A. Two aspects of our original proposal were revised. The first is that our G&A line items, which you can see at the bottom of the first and second pages and near the top of the third page, have been zeroed out. The justification for that is -- G&A stands for general and administrative. It's an internal accounting mechanism that we include in our internal AFEs, that we use to allocate payments for salaries and such. Our accounting practices do not allow us to charge that department. We are not supposed to ballot [sic] for that, and it was an error.

Q. So that was a mistake?

A. Correct.

Q. And that was one that you caught when you

reviewed the AFE?

A. Correct.

Q. So you had that removed?

A. Correct.

Q. What else was changed with respect to the AFE that was submitted over three months ago as compared to this revised AFE?

A. We also reduced our total facilities cost by $418,000.

Q. And why was the company able to reduce its facility costs reflected on the last page of this exhibit?

A. The original AFE was based on -- the estimate for that AFE was based on historical costs that we've incurred across the Basin for similar scopes. As we neared and entered into execution, we were able to beat [sic] these costs out to have a solid price, which was lower than we had estimated.

Q. So because of the passage of time, you were able to eliminate the uncertainty associated with the bids three months ago?

A. That's correct.

Q. Your new estimated figure, are those costs consistent with what the company has incurred for the 2nd Bone Spring wells in this area?

A. They are.

Q. Now, I believe Endurance's AFE that they submitted back in December -- end of December was roughly 7.3 million in its proposed costs?

A. That's correct.

Q. Can you explain to the Examiner what accounts for the roughly $1 million difference between Chevron's revised AFE and the AFE that Endurance submitted back in December?

A. The difference is primarily found in the facilities costs. Our costs come to about $2.2 million for all facilities, and Endurance's, if you account for their costs similarly to how Chevron does, round out to about 900,000 to a million. And I'll explain that. In Chevron, we put roadwork, dirt work, pad work, those sorts of costs in with our facilities cost, so that's why it may be higher than what you-all are used to representing.

Q. That's usually not -- that's, for example, not in Endurance's AFE?

A. It's in their AFE, but not advertised as a facilities cost.

Q. So roughly the difference that's in the two AFEs is the facility cost?

A. That's correct.

Q. Now, when Chevron met with Endurance back in November, did Endurance present some information on its proposed facilities?

A. They did.

Q. If I turn to what's been marked as Chevron Exhibit Number 8, is that one of the slides that Endurance then presented to Chevron back in November that addresses its proposed tank battery?

A. Yes, it is.

EXAMINER EZEANYIM: Counsel, please let's go back and address that $1 million difference in facilities cost. I know you are addressing it, but I'm not following.

Why is there that difference, because if we get it out of the way now, I might reduce the questions being asked here. Why is the facility cost this and that? What is the difference?

MR. FELDEWERT: Mr. Examiner, that's what we're getting to right now. That's what this is helpful for, I think (indicating).

EXAMINER EZEANYIM: Why there is a difference?

MR. FELDEWERT: Yes, sir. Yes, sir.

Q. (BY MR. FELDEWERT) Mr. Cheben, would you answer the Examiner's question?

A. Yes, sir. So Chevron designs to a very high level of safety and environmental standards. It's our view that, on our job sites, nobody should get hurt ever and that we should never spill any oil or produced water, and we should never attempt to flare if at all possible. We want to get, as much as possible, every molecule from the well to the sales point. Those safety and environmental standards feed directly into that cost and are a large driver of the $1 million difference.

I'll refer you to Exhibit Number 8. The tank closest to you in the picture appears to be a fiberglass tank. Chevron has a standard. It does not use fiberglass tanks in any service. Many folks in the industry use fiberglass tanks in water service. We believe that there is a severe explosion hazard to the use of fiberglass tanks due to the high potential, and in our experience, with static electricity accumulating in those tanks, an oil skim on the surface, plus potential oxygen ingress, if there is a leaky thief hatch leaking into the atmosphere. So we, as a standard, do not use fiberglass tanks in our facilities.

Q. Now, these steel tanks that Chevron uses as opposed to the fiberglass tanks, are those more expensive?

A. Yes. Our steel tanks are more expensive than

fiberglass.

Q. Now, do you also, then, do some kind of coating to your steel tanks?

A. We do. We internally plasticoat the entirety of our steel tanks to mitigate any corrosion. Produced water is very corrosive, and experience has shown us that coats left partially coated or uncoated will leak much quicker than coats not entirely coated.

Q. Now, in addition to differences in the types of tanks, are there other aspects of the facilities that Chevron uses that adds to the cost?

A. Uh-huh. There are, and I'll point out a few more examples related to the tanks. We install downcomers in our tanks, which eliminate splash loading, which, again, mitigate that static buildup that I referred to before.

I already covered the plastic coating.

We also put large emergency vents on our tanks. As everyone knows, the oil fuel valves fail, and frequently those valves introduce large volumes of gas to the tanks. If a large emergency vent is not installed on that tank, then rather than that vent popping during an overpressure situation with large volumes of gas, very frequently the tank will lose containment and a spill will occur.

In addition to that, we also incorporate more robust metering and sales, allocation equipment. Then what appears to be in the picture shown on Exhibit 8, we use truck -- lease automated custody transfer, our LACT units, on all of our facilities. The justification there is twofold. One, you eliminate any safety exposure by folks out at the gauge tanks and also eliminate the oxygen ingress risk. But we also believe that we result in a 1 percent net increase in revenue and, you know, accounted-for production by using those LACT units versus tank gauging, which leads to a much more profitable facility.

Q. Now, you mentioned this additional metering is not evident from the picture Endurance provided from its facilities. Is the downcomer that you discussed on the tanks evident from -- does it appear that Endurance has taken that aspect of safety into account in their facilities design?

A. So it's difficult to say whether they're downcomerzied [sic], their internal -- internal to the tank. However, it does appear that their tanks are loaded from the top, which would suggest that they are not fitted with downcomers. But that's only speculation on my part.

Q. Now, what about the large emergency tank?

A. Those are not visible in the picture. Actually they're there, just not visible.

Q. Now, with respect to the additional costs that Chevron incurs for facilities, is there an additional cost component that goes into its AFE that addresses the contract -- or results from the contracting standard?

A. Yes, there are. As I've stated before, we believe that nobody on our job sites should get hurt ever, and one way we ensure that that happens is that we only use contractors that have a proven history of excellent safety performance. Our metric of that is the Total Reportable Incident Rate, or TRIR, and our threshold for determining which contract companies have a standard of excellence that we approve of is 1.0. Now, that, we believe, leads to higher costs, as we generally cannot use the lower-cost bidder, as they do not have that proven safety record that meets our standards.

Q. These additional safety contracting standards that the company imposes on itself, does that come with a price?

A. Yes, it does. The contracting standard, we believe, adds somewhere between 4- and $500,000 to the cost of our facilities.

Q. Now, are these more robust safety, design and

environmental standards included in the revised AFE for the Bell Lake well that is Exhibit Number 7?

A. Yes, they are.

Q. And in your opinion, does that account for most of the $1 million difference between the --

A. Yes. Those items that we have discussed in my testimony I believe account for the majority -- or the vast majority of the $1 million difference.

Q. Were Chevron Exhibits 7 through 8 prepared by you or compiled under your direction and supervision?

A. Yes.

MR. FELDEWERT: Mr. Examiner, I'd move admission into evidence of Chevron Exhibits 7 through 8.

EXAMINER EZEANYIM: Any objection?

MR. PADILLA: No objection.

EXAMINER EZEANYIM: Exhibits 7 and 8 will be admitted.

(Chevron USA, Inc. Exhibit Numbers 7 and 8 were offered and admitted into evidence.)

MR. FELDEWERT: And that concludes my examination of this witness.

EXAMINER EZEANYIM: Mr. Padilla?

MR. PADILLA: Just a couple of questions, Mr. Examiner.

CROSS-EXAMINATION

BY MR. PADILLA:

Q. Mr. Cheben, you're not implying that Endurance operates substandard -- has substandards in regard to its facility, are you?

A. I make no such implication. I only state that Chevron has a very high standard of safety and environmental components.

Q. Let me ask you: When did you change your AFE?

A. We changed our AFE -- don't quote me on this -- approximately three to four weeks ago is when we came up with the new number and were working to revise to present in this hearing.

Q. So you revised your AFE for purposes of this hearing, correct?

A. Yes, that's correct.

MR. PADILLA: That's all I have.

CROSS-EXAMINATION

BY EXAMINER EZEANYIM:

Q. I see you use LACT units, and you don't use fiberglass on your safety equipment. Anyway, you don't have to -- but he addressed it. Do you know whether Endurance uses LACT units? I think you said they don't.

A. So per the picture shown in Exhibit Number 8 --

Q. Yeah, I'm looking at the picture.

A. There is no LACT unit there.
Q. Are you a facilities engineer?
A. I am, yes.
Q. No further questions. You may step down.
A. Thank you.
EXAMINER EZEANYIM: Call your next witness.
MR. FELDEWERT: Mr. Examiner, I would call Ken Schwartz to the stand. He's a geologist.
EXAMINER EZEANYIM: What's your name?
THE WITNESS: My name is Ken Schwartz.
EXAMINER EZEANYIM: Very good. We have to go fast, because I don't know if you want to take a lunch break.
MR. FELDEWERT: It's entirely up to you.
EXAMINER EZEANYIM: Yeah. Why don't we take a five-minute break so we can collect our thoughts?
I hope you don't mind, Mr. Padilla.
MR. PADILLA: No.
(Break taken, 11:06 a.m. to 11:18 a.m.)
EXAMINER EZEANYIM: Let us go back on the record and continue the consolidated cases.

KEN SCHWARTZ,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Would you please state your name, by whom you're employed and in what capacity?

A. Yes. My name is Ken Schwartz. I work for Chevron, and I'm our subsurface team lead for our Delaware Basin asset.

Q. As a team leader, how many geologists do you supervise?

A. Currently, I have nine geologists under my direction.

Q. Have you previously testified before this Division as an expert in petroleum geology?

A. Yes.

Q. And at that time were your credentials accepted and made a matter of public record?

A. Yes.

Q. And do you have a master's degree in geology?

A. Yes, I do.

Q. How many years of experience do you have as a petroleum geologist with an oil and gas company?

A. I have 12 years' experience, the last nine years with Chevron, and prior to that, three years with ExxonMobil.

Q. And have your more recent years been focused on

the Permian Basin?

A. Yes.

Q. Are you familiar with Chevron's application here?

A. Yes.

Q. And have you conducted a geologic study of the area?

A. Yes.

MR. FELDEWERT: Once, again, I'd tender Mr. Schwartz as an expert witness in geology.

EXAMINER EZEANYIM: Any objection?

MR. PADILLA: No.

EXAMINER EZEANYIM: Mr. Schwartz is so qualified.

Q. (BY MR. FELDEWERT) Mr. Schwartz, would you turn to Exhibit Number 9 and just briefly orient the Examiner as to where this particular area is --

A. Yeah. This is an introduction to the location we've talked about. The Bell Lake, you may not know where it is, but it's in southern Lea County, in the northeast part of the Delaware Basin, the western subbasin of the Permian Basin.

Q. And one of the Examiner's questions was where the company intended to drill its well. Can you identify the interval of the Bone Spring Sand that

Chevron seeks to develop in the Bell Lake area?

A. It's the 2nd Bone Spring Sand.

Q. Have you conducted an analysis of this particular producing interval?

A. Yes.

Q. If I turn to what's been marked as Chevron Exhibit Number 10, would you tell the Examiner what this is, what it's based on and what it shows?

A. So this is a -- this map is a structure map utilizing the Bell Lake seismic volume. It's one of the few areas in this part of Lea County that has seismic. So this is a structure map on the top of the second Bone Spring. As you can see, through Section 18 is the crest of the anticline.

Q. Now, you mentioned this is based on 3D seismic?

A. Yes. It's from 3D seismic.

Q. And what does that provide as opposed to, for example, trying to do a structure map based on well data?

A. So in this case we're fortunate that we do have seismic, so it gives the entire picture. In a well base study, you have to extrapolate between the wells, and you're kind of giving best estimate of what the rock is doing between those points. In this case, you eliminate all that. You have a full picture.

Q. Is that important here? I mean, is there a lot of well data available in and around Section 18?

A. There is some -- there is well data on Section 18 and 17. Outside of that, there is limited data.

Q. And so the seismic was of assistance here?

A. Yes.

Q. Now, you mentioned what you call an anticline. What is the nature of this anticline based on 3D?

A. So an anticline is a term in geology, structural geology, where you have a crest and the structural high. There is a high point. In this case, it runs along Section 18, and you have two parallel limbs that dip in opposing directions off that, east to the west in this case.

Q. Now, in terms of the trending, the fold is north to south, if I'm looking at this map?

A. Yes. I think if you go to Exhibit 11, I've kind of outlined that. Sorry if I'm jumping around.

Q. That's all right. Why don't you turn to Exhibit Number 11 and first identify -- identify for the Examiner and then tell us what it shows?

A. So Exhibit 11 I've kind of outlined the anticline, and then I've dashed in generally what the fold axis would be. And you can see how it's a north-trending axis.

And commonly, you know, we've observed this in outcrops and at the surface. As you bend the rock -- you can imagine that as you bend the rock along that crust [sic], you'll get natural fractures in a form. And we observed that in field studies.

Q. Now, with respect to this particular exhibit, we see the seismic data, your time structure map on the left, and then we see some illustrations on the right. Where did that come from, and what does that show?

A. So these are just some examples I pulled out of my structure textbook in college. You know, this is where it's discussed. It's just an example. It's a schematic of how the fractures form in an anticline along the crest of the structure.

Q. So when I have a north-to-south trending anticline, how does that impact the natural fracture system? What happens to those fractures?

A. So if you have a north-south trending fold axis, the natural fracture system will parallel that fold axis. So you can see from the schematic, when you fold it, all the fractures are going to parallel that fold axis.

Q. And what does that mean for this particular area? Will the natural fractures be oriented based on the seismic data?

A. So the natural fractures oriented north-south paralleling that fold axis.

Q. And what does that tell you in terms of how you want to orient your well for maximum drainage?

A. So for maximum drainage, you want to intersect as many fractures as you can. So at this point, you would want to drill east-west, so you're going to cross a number of these north-south trending fractures.

EXAMINER EZEANYIM: Let's get that clear. Very important. Your seismic -- you did your 3D seismic. You are showing that the fracture is north-south, right?

THE WITNESS: Yes.

EXAMINER EZEANYIM: And you want to drill your well -- you want to drill your well --

THE WITNESS: Yes.

EXAMINER EZEANYIM: -- not parallel to the natural strikes; is that correct?

THE WITNESS: We'd want to drill a well perpendicular to the fractures.

EXAMINER EZEANYIM: Okay. And there are consequences for fracturing, too. When you want to fracture a well, if you, you know --

THE WITNESS: Yes.

EXAMINER EZEANYIM: Well, anyway.

THE WITNESS: You're right.

EXAMINER EZEANYIM: I understand what you're saying, but that's fine. I just wanted to clarify what you're saying. You are saying that you have -- you did -- I like the seismic, because seismic gives the natural orientation of the natural fractures. Then in that case, we decide on where to go, you know. It's not necessarily that you have to go against it, but for how they're fracturing, you need to do that right.

THE WITNESS: Yeah. So if you have -- regardless of your wellbore orientation, if you have natural fractures, when you complete your well, it's going to tend to follow those weaknesses in the rock.

EXAMINER EZEANYIM: Of course, yeah. So it will follow the least resistance.

THE WITNESS: Yeah.

EXAMINER EZEANYIM: Okay. Very good. Go ahead.

Q. (BY MR. FELDEWERT) Let me ask a couple of things. First off, you used the seismic up to this point, Mr. Schwartz, to identify the anticline, correct?

A. Yes.

Q. And then the nature of the anticline is such, then, that it shows your -- based on just textbook information, that the natural fracture is just following

the anticline and running north-south, is that right?

A. Yes. Yes.

Q. Does the seismic data -- since you have it available, does it not only allow you to confirm the anticline that you need for this area, but does it also allow you to confirm the natural fracture system?

A. Yes. And if you go to Exhibit 12, because we have the three seismic, there are algorithms you can run on a seismic. And in this case, there's a curvature analysis. And think of it as kind of a roughness of the surface.

And in this case, you can kind of see how the red and the purple form lineaments that also trend north-south, and that's also suggesting that the fracture orientation will parallel those lineaments. So there are strong or soft lineaments in nature to the seismic.

Q. And just to orient the Examiner for the record, you have outlined on this particular seismic reading, in yellow, Section 18, correct?

A. Yes. Outlined in yellow is Section 18, and then that is the section of interest.

Q. And what you're referencing here is the fact that the colors tend to go north to south?

A. Yes, in Section 18.

Q. And that reinforces what you would expect to see from an anticline system that we see in Section 18?

A. Yes.

Q. And that anticline that we see in Section 18, is that unique to the Delaware Basin? I mean, do you see that very often?

A. No. It's -- during the Permian time, it was pretty quiet tectonically. You don't see a lot of faulting and folding, so it is a unique feature in the Basin to see a structure like this at this time period.

Q. And based on your analysis, it seems to be centered, basically, across the entire Section 18, correct --

A. Yes.

Q. -- if I look at Exhibit Number 11?

A. Yes. If we go back to Exhibit Number 11, it is -- the fold axis and the crest of the anticline crosses the center of Section 18, and, also, this suggests the maximum horizontal stress orientation. It would be east-west at this time.

Q. And then it falls off as you go to the right or left of Section 18?

A. Yes.

Q. Did you have a chance to look at -- now, I need to step back. You participated in the meetings with

Endurance in November?

A. Yes, I was there.

Q. And did they present a structure map at that time?

A. Yeah, they presented a structure map.

Q. Did you have a chance to review it?

A. I reviewed it with them at the time they presented their data, and I -- yeah, I reviewed it.

Q. Now, let me ask you something. Was it based on seismic?

A. As far as I can tell, it was based on well control.

Q. And how does their structure map that they presented in November compare with your structure map that is based on seismic?

A. So if you go to Exhibit 14, I labeled both --

Q. I'm sorry. Exhibit 13, wasn't it?

A. Sorry. Yeah, 13. I just did a comparison with Endurance and Chevron structure maps. They did pretty acc- -- you know, it was pretty good. They defined the anticline using the well data, but I think, with Chevron having the seismic, we were better -- we more accurately placed that anticline over Section 18. And, you know, the anticlines are fairly parallel. You know, they also suggest a, roughly, north-south trending

fold axis.

Q. And just for the record, on the left-hand side, you have Section 18 outlined in blue, with the dotted black line going through the middle of it?

A. Yes.

Q. And then on the right-hand side, the comparable area is also outlined in blue, Endurance's well structure --

A. Yeah. I apologize. It blends in with their coloring scheme, but if you can tell, it's outlined in blue.

Q. Now, when Endurance did its structure map, did they have any well control to the east or to the north -- to the west or northwest?

A. Well, as I testified earlier, you know, this is a focused area for them, so I'm sure, you know, this is an area they focused on. So they just used the data in the immediate area.

You know, Chevron has a million acres. We've mapped the 2nd Bone Spring throughout the whole Delaware Basin, so we utilize a much larger data set. So we utilized wells to the north, to the west. It covers a much larger data set. So when we grid and contour, you know, when we have to or we utilize the seismic, we have a better picture.

Q. And the seismic, then -- I mean, you don't have any holes with your seismic, right?

A. No. No.

Q. It gives you continuous coverage?

A. It's continuous coverage to this area.

Q. This unique structure that we see in Section 18, does it also assist with drainage if you have an east-to-west oriented well?

A. Yeah. I believe that's pictured on the next exhibit, 14.

Q. Okay. Let's turn to Chevron Exhibit 14. Why don't you tell us what it is and what it shows?

A. So this is a cross section of the seismic through the Bell Lake seismic sheet, going across east-west through Section 18. So I've outlined -- the yellow arrows represent the top of the 2nd Bone Spring, and the base of the Bone Spring is the top of the 3rd Bone Spring. So that's the interval in question, between the 2nd and 3rd Bone Spring. And this is just an outline of how our east-west well is going to be drilled in a toe-up configuration. And, you know, because we have the seismic, we also have the advantage to land the well and steer it and make sure it stays within the zone.

Q. What's the advantage of a toe-up configuration?

A. So our production engineers like that, because the fluid -- the liquids flow to the, you know, in this case, the heel, right below the vertical portion of the wellbore, and it allows for easier production capability.

Q. Anything else about this map?

A. No. I think it's good.

Q. Now, have you also had a chance in preparation for this hearing to look at just the depositional system that you see in this part of the Delaware Basin with respect to the Bone Spring Sand?

A. Let me just step back on one thing about talking about stress orientations and things like that, because it is kind of a topic of concern. But Chevron has participated in 60 to 100 Bone Spring wells, partner wells, in the last year and a half. We've collected 40 FMI image logs, gotten core from the Bone Spring. We've had microseismic. We've looked at multi-arm caliper logs. We use dipole sonic.

And I can testify that the stress orientation varies greatly within the basin. So we've drilled east-west wells that outperformed north-south wells. We've drilled, you know, north-south -- we prefer some areas to drill north-south, some areas we prefer east-west. We've got a pretty good handle on the

stress orientation throughout the Basin from all this information, and it varies. And this is a unique area because of the fold, and the orientation of the fractures is going to be north-south. You don't see that in any other part of the Basin.

Q. So Section 18 has kind of a unique feature that results in the fractures going north-south?

A. Yes.

So sorry, you can go ahead with your --

Q. Well, I was going to turn, then -- I think you did an analysis -- putting aside all the seismic data and putting aside the anticline we have here in Section 18, what is -- just as a general matter, how is the Bone Spring Sand generally deposited in this particular area?

A. So the next exhibit kind of shows the depositional model for the Bone Spring Sand.

Q. You're on Exhibit 15?

A. Yes, Exhibit 15.

So you have sands shedding off from the northwest shelf, channelized system moving south to the deeper part of the Basin. At that point it folds and forms basically -- in this case, around Section 18, it's more of a channel to a weakly confined system. So in the areas, we've -- when we don't quite understand -- with a channel axis, the channel axis generally has a

better reservoir quality and better porosity plum. We have drilled east-west to mitigate some of the risk. So we know we will cross that better porosity streaks and ensure a better well.

Q. Now, let me focus a little bit more on this exhibit in terms of where Section 18 would fall, that general area. On this, you show a number of systems here. Where would Section 18, that area, fall within your Exhibit Number 15?

A. So it's -- you know, it's a slope valley system to weakly confined, so it won't matter. We're off the gradient of the slope. It's entering more of the deeper part of the Basin. And it is an area that -- you know, it's starting to emerge. We're starting to see more drilling activity, and this picture will become clearer.

Q. And you mentioned that in the areas where you don't have a lot of well control and you don't know where the channel axis exists, that you tend to go east to west because you have a better chance of hitting that channel axis?

A. Yeah. We've done that, and we've had success and produced great wells.

Q. Because that's the sweet spot, right?

A. Yeah. You want to find. You know, obviously, landing your well in the right zone, reservoir, good

porosity, good perm, you're going to have a better well. If you land it in poor rock, you're not going to have a better well.

Q. In an area like this, where you have this north-south channel system, if you drilled north-south, you might hit right in the middle of the axis and have a really good well, or you could be outside of the channel, correct?

A. Yeah, that's a possibility.

Q. And will an east-west well provide information perhaps on where the axis of this channel actually is?

A. Yes.

Q. Have you been able to examine the available data in the area to develop an isopach map for the Division?

A. Yes.

Q. Why don't we turn to what's been marked as Chevron Exhibit Number 16. Identify it for the Examiner; explain what it's based on and then what it shows us.

A. Again, Section 18 is roughly in the center of the map, and it shows the well data we've used to create this regional isopach map. It's the gross interval of the 2nd Bone Spring Sand. The contour interval is 50 feet. And from this map, you can see how the 2nd Bone

Spring thickens to the northwest, so towards the A. And the A point on the map -- that blue line that goes from A to B, that's a cross section that we'll see in a moment. But, in general, you see thickening of the 2nd Bone Spring to the west.

Q. And the data points -- you mentioned Chevron has a lot of data in this particular area. In developing this map, you took into account all of the data?

A. Yes, all the data that we had available to us.

Q. And I see below the well symbols there will be a number. That's total thickness?

A. Yes.

Q. Now, this is a gross isopach map?

A. Yes.

Q. Did you -- for the Examiner, did you provide, then, a close-up of Section 18?

A. Yes. One observation I want to make about this map is notice how over Section 18, it's a little thinner and gets thicker to the west. That kind of corresponds with where you see that anticline. So is that control deposition? Maybe, maybe not. So you do see some thickening as you go west. So there is a question that maybe the anticline did form some -- did have some control over the deposition.

So we did narrow it down. So the next map will show a more focused -- looking at Section 18.

Q. If I turn to Chevron Exhibit 17, that's sort of the same map. It's just a close-up, for the Examiner, focusing on Section 18 in the middle and that nine-section area around it?

A. Yes. We're just bringing in the map closer. You know, we are focused on 18, and I just want to show that generally the gross thickness is, you know, uniform throughout Section 18. It's around 430 to 450 feet.

Q. And that's your gross isopach; is that correct?

A. Yes, it is.

Q. Now, I know the Examiner is always interested in this. What is your -- did you develop a net isopach map?

A. Yes, I did.

EXAMINER EZEANYIM: Good.

Q. (BY MR. FELDEWERT) Is that Exhibit 18?

A. That is, yeah, Exhibit 18.

Q. Why don't you tell us what you used to develop this and what it shows you?

A. So from the gross isopach -- pardon me. From the gross thickness, we used defined cutoffs. In this case, we used a density porosity cutoff of 8 percent and a gamma ray range of 40 to 80 to define the sand

reservoir interval.

And, again, this just represents a nice, consistent thickness across Section 18, around 265 feet of net reservoir.

Q. Do you see here a continuity of sand across Section 18?

A. Yes.

Q. Does that allow for the development of this area using horizontal wells?

A. Yes.

Q. Now, you mentioned -- you talked about your blue line that is seen on Exhibits 18, 17 and 16, and they correspond to a cross section, correct?

A. Yes.

Q. If I turn to what's been marked as Chevron Exhibit Number 19, is that a cross section of the logs that you've utilized for your study? Did I say that right?

A. Yeah. These are part of the wells that we used in the study, and, also, these wells represent that cross section.

Q. And how does it correspond to the previous exhibit in terms of the orientation, because I think we lost our A to A to B?

A. Yeah. So A was the farthest well up to

northwest where it thickens, and B is in Section 17, in the immediate contiguous section to the east of Section 18.

Q. So on this particular cross section, you have two wells in the east half of Section 17?

A. Yes.

Q. And then two wells in the center of Section 18?

A. Yes.

Q. And then you were able to add that additional well toward the northwest?

A. Yes. That was just one of the nearest wells as a controlling point to the northwest.

But the four wells on the east half of this cross section are the closest wells to the immediate Section 18. As you can see, I defined the top of the 2nd Bone Spring and the base of the 2nd Bone Spring. It's pretty easily mapped with just a nice carbonate unit that define that interval, and there are two, you know, lines. One is kind of a darker orange that defines the top and a lighter orange that forms the base. As you can see, in Sections 17 and 18, there's a pretty uniform thickness of that 2nd Bone Spring interval.

Q. Anything else about this exhibit?

A. No.

Q. Were you able to use this data to also develop, for the Examiner, a porosity map?

A. Yes.

Q. Is that Chevron Exhibit Number 20?

A. Yes.

Q. And what does this show us? How was it developed, and what does it show us?

A. So this is a map that just represents the total thickness -- porosity thickness using our cutoff, and, you know, basically, we're just stepping down and defining quality rock. In this case, again, it just shows a nice continuance of similar-quality rock through Section 17 and through 18, roughly 28 feet of porosity thickness.

Q. Now, there was some talk about, you know, the federal acreage here involved in the south half of 18 and also in Section 19. Do you see this continuity as you move south into the south half of 18 and then into 19?

A. Yes.

Q. In your opinion, Mr. Schwartz, is the north half of Section 18 an area that can be effectively developed within east-to-west horizontal wells?

A. Yes.

Q. You don't see any geologic impediments to a

full-section east-to-west well?

A. No.

Q. Does your study indicate that a stand-up well in this area is superior to a lay-down well?

A. No.

Q. So if you were going to summarize it, what do you see here as the basis for your opinion? What do we have in the summary basis?

A. So, yeah, it's a good point to reiterate, you know, that this anticline is a unique feature, and we don't see that much in the Basin. So we really -- you really need to take that into account in the orientation of your wells. So you have a nice anticline over Section 18. You're going to have natural fractures that develop on the crest of that anticline in the north-south orientation, so you want to drill east-west to intersect as many of those natural fractures as possible.

I see a nice continuous uniform thickness of reservoir through Section 18. Utilizing the seismic, we can make sure we stay in the zone and drill, you know, the best part of the rock. We'll stay in a toe-up configuration when we drill that well.

Anything I'm missing?

Q. I think you got it.

Now, based on your study, do you believe that waste will occur from a lay-down well from the fee lands in the north half of Section 18?

A. No.

Q. And based on your opinion, do you believe that Chevron's east-west well will efficiently develop the reserves in the north half -- the north half of Section 18?

A. Yes.

Q. Now, at the pre-hearing conference, Mr. Schwartz, the Division indicated that if it was possible, they wanted to see an EUR study.

A. (Indicating.)

EXAMINER EZEANYIM: He's not an engineer.

MR. FELDEWERT: What's that?

EXAMINER EZEANYIM: He's not an engineer.

MR. FELDEWERT: He's not, but there are two aspects that I want to address.

EXAMINER EZEANYIM: Okay.

Q. (BY MR. FELDEWERT) As a geologist -- as an expert in petroleum geology, what factors impact an EUR false? Have you summarized them on Chevron Exhibit 21?

A. Yes. If we look at Exhibit 21 -- you know, there are many factors that affect an EUR and well performance. Your completion design can really affect

how well -- how great of a well you have, you know, your stage spacing, how much fluid you pump, how big a frack to put on it, number of clusters, fluid types, et cetera, but then also geology plays a critical role.

You can land your well in a poor part of the reservoir, and the performance of your well won't be as good if you land in the best porosity. The orientation does matter in some areas, because like this case, the orientation of east-west because it's on an anticline, and, you know, some parts of the Basin, more north-south is preferred. You have a lateral length. Commonly we see that longer laterals have better producibility.

But unless you take all these into account -- you know, you've got to look at each individual well, and look how they're completed, land those wells -- look at the type of reservoir they landed in before you do a proper EUR analysis.

Q. Now, did Endurance represent to you at their meeting that they had done an EUR analysis for the area?

A. Yes.

Q. And did they identify what that EUR analysis was based upon?

A. Yes.

Q. If I turn to what's been marked as --

MR. FELDEWERT: I'm going to skip ahead a little bit, Mr. Examiner.

Q. (BY MR. FELDEWERT) If I turn to what's been marked as Chevron Exhibit 23, is the -- and we're going to have another witness discuss this, but the depiction on the left-hand side column, is that what Endurance presented to you either at the November 20th hearing or thereafter?

A. Yes.

Q. And did they represent that those were the wells that they analyzed in doing their EUR analysis?

A. Yes.

Q. If I'm reading this correctly, Section 18, at least on their map, is identified in red on Exhibit 23 in that left-hand column, correct?

A. Yes.

Q. Says "Subject Acreage."

And then green identifies Endurance's acreage, correct?

EXAMINER EZEANYIM: Am I looking at the same thing?

MR. FELDEWERT: Exhibit 23.

EXAMINER EZEANYIM: This one?

Q. (BY MR. FELDEWERT) So I'm looking on the left-hand side of Exhibit 23?

A. Yes, sir.

Q. And I see that Section 18 is identified, according to their map, in red.

EXAMINER EZEANYIM: Oh, that small dot there?

MR. FELDEWERT: Yes.

Q. (BY MR. FELDEWERT) Now, this study that they apparently did looks like they included wells that were almost 15 miles away?

A. Yes.

Q. And it looks like they included wells in their EUR analysis that covered almost eight townships?

A. Yes.

Q. In your opinion as a geologist, an expert in petroleum geology, can you compare the performance from a well 15 miles, let's say, to the north of Section 18 with wells three to seven miles, let's say, to the southwest of Section 18?

A. No. The geology will vary.

Q. Is it like mixing apples and oranges, in your opinion?

A. Yes.

Q. If you were going to conduct -- now, recognizing we have a unique feature in Section 18 -- we have an anticline -- if you were going to conduct an EUR

study in general, just to compare how a north-south orientation does to east-west, what would you look for? What would you tell your engineer to look for?

A. So we would define the reservoir, make sure all -- we'd look at the wells, make sure they were landed in the same reservoir, and then make sure they had the same completion design, very similar completion design. And in that case, you would have a proper EUR study.

Q. So you'd look for an area that's got some development, right?

A. Yes.

Q. Same zone?

A. Yes.

Q. Same -- you'd hope, similar geology or same geologic?

A. Yes.

Q. Similar completion techniques?

A. Yes.

Q. Would the time frame in which the wells were drilled and the number of operators involved be helpful in determining, you know, whether you use similar completion techniques?

A. Yes.

Q. With those parameters in mind, was Chevron able

to locate a nearby field that fit your criteria?

A. Yes.

Q. And where was that located?

A. Directly to the southwest of the Bell Lake acreage. I think it's the Dos Equis area.

Q. So if I look at Exhibit 23, and I look at Section 18 in red and I go to the southwest, along, ironically, what is an orange line here, I get to an area that has more extensive development in it?

A. Yes.

Q. And I see both lay-down and stand-up wells?

A. Yes.

Q. Is that the area, to develop an EUR study, for the Examiner, you had your engineers focus on?

A. Yes.

Q. And in that type of an area, would you expect to be able to compare a north-south orientation and east-to-west in more of an apples-to-apples orientation?

A. Yes.

Q. Did you assist in performing that study?

A. Yes.

Q. Do you have a witness that's going to address it?

A. Yes.

Q. Here's the big question: What did you find in

doing that apples-to-apples comparison in this nearby area?

A. So we did a study in that area. We actually found east-west outperformed north-south.

Q. But, again, to be fair, in Section 18, we have a unique area, correct?

A. Yes.

Q. It's an anticline?

A. Yes.

Q. Were you able to locate an area in the Basin where you could do a study of north-south versus east-to-west wells in an anticline environment like you see in Section 18?

A. No.

Q. In your opinion, would the granting of Chevron's application be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. And were Chevron Exhibits 9 through 21 prepared at your direction -- or complied by you or at your direction and supervision?

A. Yes.

MR. FELDEWERT: Mr. Examiner, I would move admission into evidence Chevron Exhibits 9 through 21.

EXAMINER EZEANYIM: Any objection?

MR. PADILLA: No.

MR. FELDEWERT: That concludes my examination of this witness.

EXAMINER EZEANYIM: Very good. Exhibits 9 through 21 will be admitted.

(Chevron USA, Inc. Exhibit Numbers 9 through 21 were offered and admitted into evidence.)

EXAMINER EZEANYIM: Mr. Padilla.

CROSS-EXAMINATION

BY MR. PADILLA:

Q. Mr. Schwartz, looking at Exhibit 23, you testified that you looked at those wells clustered around the lower half of this map, right?

A. Yes.

Q. And how many wells are north-south in that cluster?

A. Let's see. You know, 10, 12, somewhere in there.

Q. I'm sorry?

A. 10 to 12, roughly, somewhere around there.

Q. How many wells on the east-west orientation?

A. Two.

Q. Did you do the geology for the wells that

Chevron has drilled in Sections 23 and 24 of --

A. Yes.

Q. Can you tell us why you orient those wells north-south?

A. In that case, we did a study, and we determined that north-south was the proper orientation.

Q. Now, down in 24 South, 33 East in Section 29, you've drilled four wells, haven't you?

A. Can you give me that section again? Sorry.

Q. 24 South, 33 East, Section 29.

A. 24 South, 33 East, Section 29, correct?

Q. Right.

A. Those are permitted wells. We haven't drilled those yet.

Q. But you're going to orient them north-south, right?

A. Yes.

Q. Did you do the geology for those wells?

A. No. Those were Chesapeake wells that we inherited. So they're permitted wells, but we haven't --

Q. You're not going to change the orientation, are you?

A. Don't know yet.

Q. How about the well in Section 11 of 23 South,

33 East that Chevron is drilling or proposes to drill?

A. Yeah. It's a north-south well.

Q. Is that drilled?

A. Yes.

Q. Is that on this anticline that we're talking about today?

A. No.

Q. Did you review the geology before participating in the wells in Section 20, in the immediate area southeast of Section 18?

A. The Caza well?

Q. Yes.

A. Yes.

Q. And did you agree with the orientation there?

A. Say that again.

Q. Did you agree with the north-south orientation of that well?

A. Yes. We have a small interest in that well, and, again, it's off structure. And we weren't the operator.

Q. How about the wells in Section -- in the section to the west that are proposed by Endurance? Have you made any objection to the orientation there, the north-south orientation?

MR. FELDEWERT: Let me -- section to the

west of what?

Q. (BY MR. PADILLA) Section 29.

A. Section 29?

Q. Yes.

A. Of 23 South, 34 East?

Q. Right.

A. So two sections down from Section 18?

Q. Yes.

A. I've seen the Section 19 well proposal.

Remind me of Section 29. What wells are those?

Q. Wells proposed by Endurance.

A. What are the names of the wells?

Q. They're the Broadcaster wells.

A. What are the Section 19 wells? Sorry. What are those names?

MR. RITTER: Nocaster.

A. I recall the Nocaster, but I'm not sure about the Section 29 wells.

Q. (BY MR. PADILLA) You haven't objected to any wells north-south?

A. I haven't expressed that, but obviously, through my testimony today, I'm concerned. I am concerned.

Q. When did you conduct the seismic that you're

testifying today about?

A. When did I conduct that seismic study?

Q. Yes.

A. It was post-meeting with Endurance on November 20th.

Q. Did you ever tell Endurance about the results of your seismic findings?

A. No. Endurance and Chevron were going through a strained -- I would call it a strained relationship at that point. We were competing for mineral interests in Section 18. We were partners, yet competitors, so obviously it was a difficult relationship. And obviously we don't like to have a relationship like that. We would like to be more open. I'm sure Endurance doesn't like where this has ended up, but this is where we're at.

So at that point, it seemed like everything I was relaying to Endurance, they were using against us as we were competing for mineral interests. So at that point, I felt Endurance was pretty adamant about drilling a north-south well, so, unfortunately, this is where we're at.

Q. So you've developed this theory --

A. It's not a theory. It's proven. It's textbook.

Q. Yeah. I heard your testimony that you looked in your college textbook. And then you've also testified that Endurance utilized well control, and you're relying on seismic. Is that fair to say?

A. We use well control and seismic. We're using the best of both worlds.

Q. And you use well control, as I understand your testimony, from all over southeast New Mexico?

A. We have a lot of acreage, so we look at a lot of area. So we have a large regional study, so, you know, we understand the system throughout the whole Delaware Basin.

Q. And it's my understanding that Chevron has not drilled any wells in the immediate area of Section 18.

A. Well, you asked about our Section 11 and Section 23 wells. Would you call that immediate area? Yes, we have.

Q. And they're oriented north-south, right?

A. They're also off the anticline, and it seems like you have a thicker reservoir over there. It's more of a channel axis.

Q. And you've also testified about stress orientation, correct?

A. Yes.

Q. And is your engineer going to talk about stress

orientation in terms of intersecting -- intersecting those stress fractures by a horizontal well?

A. No.

Q. You're not going to -- you haven't testified about that, correct?

A. No. The reason why I haven't testified is because that's a natural fracture system. I did testify that those natural fracture systems will control. When you complete your well, that's your path of least resistance, so north-south trending fractures. It doesn't matter where you drill, where you frack it, it's going to follow the paths of least resistance, regardless of what the current stress orientation of the Basin is.

Q. Other than your folding theory on the anticline, you don't have any testimony here today, as I understand, neither are you testifying concerning orientation of stress fractures -- the stress orientation, right?

A. I am testifying as an expert in geology and understanding the stress orientation in the Delaware Basin. Like I said, we have 40 FMIs that show the fractures, and image logs, through the Bone Spring. We have microseismic studies that show the fracturing. We have caliper logs. We have dipole sonics. We have

four-hole breakout evaluations we've done throughout the Basin. So we have a pretty good handle on the stress orientation. Unfortunately, that is confidential and -- I can testify that I have an understanding of the stress orientation in the Basin, and it varies greatly where you're at.

Q. And you didn't bring anything here today to support your theory in this immediate area as far as stress orientation?

A. Well, that would be pointless because Section 18 is anticline. It's a unique feature. So like I said, regardless of the stress orientation -- because there is already an established weakness in the rock, when you break -- when you complete the well, put a hydraulic fracture on it, it's going to follow the natural fractures regardless of the stress orientation.

Q. And that's theoretical because you're not using any well control at this point, right?

A. Right. Yes.

Q. Do you know what direction the maximum orientation is, the max stress orientation?

A. Where?

Q. I mean, do you haveit in your testimony here, based on what you're presenting today?

A. Yeah. I mentioned we have a lot of data, and

it varies throughout the Basin. It just depends where you are in the Basin where the max stress orientation is.

MR. PADILLA: I think that's all I have, Mr. Examiner.

EXAMINER EZEANYIM: Okay. Thank you.

Mr. Feldewert?

MR. FELDEWERT: Just a couple.

REDIRECT EXAMINATION

BY MR. FELDEWERT:

Q. I think they went through a litany of wells in Sections 23, 24, 29. Would you turn to Exhibit 13, please? Actually, a better exhibit might be Exhibit 11. Do any of those sections that you just discussed with Mr. Padilla involve an anticline like we see from the seismic data for Section 18?

A. No.

Q. Is it important, as we move forward in analyzing the data, that we make sure that it's focused on this unique geologic feature that we have in Section 18, in your opinion?

A. Yes.

Q. Now, with respect to your seismic data that you have available, is that information that the company treats as confidential?

A. No. In this case, the seismic data is public. You could buy it. This seismic, you could buy it.

Q. And the company expended the funds to purchase it?

A. Yes. We have a license. We probably can't share it. You know, we can't, like, show you the map. I can't --

Q. Can't share the data?

A. No.

Q. And at the time after your meeting, you mentioned that they were competing with you for leases in this area, correct?

A. Yes.

MR. FELDEWERT: That's all I have. Thank you.

EXAMINER EZEANYIM: Any other questions?

MR. PADILLA: No. I don't have anything further.

EXAMINER EZEANYIM: Okay.

CROSS-EXAMINATION

BY EXAMINER EZEANYIM:

Q. What is the exhibit that shows the net isopach map? What exhibit? I forgot.

MR. FELDEWERT: I believe it's Exhibit 18, Mr. Examiner.

Is that right?

THE WITNESS: The net isopach is Exhibit 18.

Q. (BY EXAMINER EZEANYIM) Your gamma ray is 40 to 80, right? I can see that.

A. Yes.

Q. And is that density or porosity?

A. Density porosity.

Q. Okay. Density porosity. And that's your cutoff?

A. Yeah, that's the cutoff. It varies with the company. That's what we use.

Q. And this is drilling east to west, right?

A. Yes.

Q. Is that porosity determined if you are drilling north to south?

A. We use the same porosity cutoff regardless east-west or north-south.

Q. Very good.

You are the senior geologist at Chevron. I know you've gone through this. I'm looking at this net isopach now. Is there anything wrong going north-south in that isopach map that you gave me?

A. Just looking at the isopach map without any other knowledge, east-west, north-south equal.

Q. That's not my question, because not what I wanted to say, and you told me that now without even going to do the calculation, because that's what that shows me there. It shows me that you can do it east-west; you can do north-south, right?

A. Right.

Q. Now you are going to do a calculation to see which one is best?

A. Yes.

Q. This is what the net isopach shows?

A. Yeah.

Q. What average thickness are you using? Of course, you're not supposed to answer that. You're no good to answer that.

You answered my questions, Mr. Schwartz. But if there is any more geology, you might be recalled, because this is a contested case, and you don't know what their geologist will say. If it's in conflict, be prepared to be recalled, but, meanwhile, you are excused.

A. Okay. Thanks.

EXAMINER EZEANYIM: I don't know what you guys -- I think we should take a break now.

MR. FELDEWERT: This may be a good time to take a break, Mr. Examiner.

EXAMINER EZEANYIM: Yeah, take our lunch break. And we have to finish this before tomorrow because I have another appointment tomorrow.

MR. PADILLA: We can finish.

(Discussion off the record.)

(Break taken, 12:11 p.m. to 1:20 p.m.)

EXAMINER EZEANYIM: We've finished with two witnesses, right?

MR. FELDEWERT: Three, Mr. Examiner.

EXAMINER EZEANYIM: Okay. You have your last witness, right?

MR. FELDEWERT: Yes, sir.

EXAMINER EZEANYIM: Call your last witness.

MR. FELDEWERT: We'll call Zachary Sigmundik.

EXAMINER EZEANYIM: You've already been sworn, right?

THE WITNESS: Yes.

EXAMINER EZEANYIM: Good. You are still under oath.

ZACHARY SIGMUNDIK,

after having been first duly sworn under oath, was questioned and testified as follows:

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DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Would you please identify by whom you're employed and in what capacity?

A. I work for Chevron USA, Inc. as a petroleum engineer.

Q. And how long have you been with Chevron USA?

A. I've been there for three years now.

Q. Have you had a chance to previously testify before this Division?

A. No, I haven't.

Q. Why don't you outline your educational background?

A. I was a 2011 graduate of Texas A & M University with a bachelor of science in petroleum engineering.

Q. Have you been, then, employed by Chevron full-time since graduating?

A. That's correct, Mike.

Q. As a petroleum engineer?

A. Yes, sir.

Q. What has been your area of focus?

A. I've been primarily focused in unconventional resources in Colorado, New Mexico and West Texas.

Q. The horizontal development in the 2nd Bone Spring Sand that's being discussed today, would that be

considered an unconventional resource?

A. Yes, it is.

Q. And have your responsibilities included the Permian Basin of New Mexico?

A. Yes, they do.

Q. Are you a member of any professional organization?

A. I'm an eight-year member of the Society of Petroleum Engineers.

Q. Are you familiar with Chevron's application in this case?

A. Yes, I am.

Q. And have you conducted a study of the 2nd Bone Spring Formation in the subject area?

A. Yes, I have.

MR. FELDEWERT: I'll tender Mr. Sigmundik as an expert witness in petroleum engineering.

EXAMINER EZEANYIM: Any objection?

MR. PADILLA: No objection.

EXAMINER EZEANYIM: You made a good choice.

THE WITNESS: Thank you.

EXAMINER EZEANYIM: But you need get your registration. I would to see you get your registration. You are from the best club.

You are so qualified. Go ahead.

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Q. (BY MR. FELDEWERT) Mr. Sigmundik, did you review the EUR study that Endurance presented to Chevron back at the November meeting?

A. Yes, I have.

Q. And as an expert in petroleum and reservoir engineering in production, does that study indicate a stand-up well in Section 18?

A. No, I believe it doesn't.

Q. If I turn to what's been marked as Chevron Exhibit 22, does that provide a summary of some of your opinions?

A. Yes, it does.

Q. And what can you offer the Examiner here with respect to an EUR study in this type of an area?

A. If you recall from Mr. Schwartz' testimony, to conduct an effective EUR analysis of an area, you have to have a few things. He identified similar geology, similar completions, similar lateral length, just to name a few.

In addition to that, you want a significant well count so that you have a full understanding of the range of outcomes, and you want significant time on production, particularly with unconventional resources to understand the late time effects of production.

Q. Did you observe problems when you looked at

Endurance's EUR study that they presented in November?

A. Yes. When I reviewed Endurance's EUR analysis, I identified, one, that the subject area that they were investigating was significantly large. I believe it covered eight townships.

Number two, the well count was rather insignificant given that large area. The total well count was 42 wells, of which there were only ten in the east-west direction, and 32 in the north-south direction.

And finally, when you consider the actual production, the historic productions, for those wells, you see an additional discrepancy, that there is very little to no history on the wells that they've identified in their analysis.

EXAMINER EZEANYIM: Excuse me, Counselor.

What's your name again?

THE WITNESS: Zachary.

EXAMINER EZEANYIM: Zachary, this Bone Spring pool, is it unconventional? You used that word. What is the nature of the permeability here, before we start talking about unconventional? Are those so tight that you've classified them as unconventional?

THE WITNESS: So the definition of an unconventional resource -- and I'll talk about this

later. This is identified out in the Society of Petroleum Evaluation Engineers Monograph 3. That's identified as a region that has similar characteristics, from a regional perspective, in which case you would require statistical analysis to fully understand the broad spectrum of outcomes of the particular wells. That doesn't say that there aren't pockets of sweet spots, so to speak, within those regions, but you do understand that you do need to have sufficient well count to identify and fully describe those sweet spots.

EXAMINER EZEANYIM: Yeah, I understand that. My question didn't really go directly to what you're saying. It's just for my own knowledge because I'm in charge of all this.

I just wanted to know whether this area now, are we going to classify them as unconventional? I've never thought about them as unconventional. They are a resource play in the Bone Spring, especially the Bone Spring Sand. Some of them have been prolific. So when you use the word "unconventional" -- it doesn't have anything to do with your case, the way you are presenting, but I want to -- when you use that word, I want to make sure I understand that we are not going to label that play as unconventional in the Bone Spring. I know we have those shales, and we have those gas sands

[sic], but I don't think it exists in the Bone Spring. See what I mean?

I mean, you know, because if you are telling me that, that's a different question. It's not -- it's not related to what you're saying. So don't try -- don't be trying to, you know, say something, you know to advance what you say. But I wanted to learn from you whether -- are you trying to say that that play is unconventional?

THE WITNESS: I understand that you're saying there is indeed a discrepancy between a shale play and this Bone Spring Sand.

EXAMINER EZEANYIM: No, no. That's not what I'm saying. What I'm saying is that -- this is the 2nd Bone Spring Sand, right?

THE WITNESS: This is the 2nd Bone Spring Sand.

EXAMINER EZEANYIM: Okay. Now, is this unconventional?

THE WITNESS: The permeability is so tight that yes, I would consider it.

EXAMINER EZEANYIM: In the other microdarcy?

THE WITNESS: At least in the microdarcy scale, and in places, probably nano.

EXAMINER EZEANYIM: Okay. Let's not go there, because it doesn't -- it's not related to either of you. I just want to know. You see the problem I recognize -- I didn't want to let it go because I want to know if it's unconventional. Then I have to develop with a different, you know, plan or program to see how we can go through it. That's where -- you know, when you used the word "unconventional," it strikes my chord because I don't want it to be unconventional. I want it to produce.

MR. FELDEWERT: Okay. Shall we move on?

EXAMINER EZEANYIM: Sure.

Q. (BY MR. FELDEWERT) If I turn -- now, you mention the problems that you saw. Let's turn to what's been marked as Chevron Exhibit 23. Did you create this exhibit, Mr. Sigmundik?

A. Yes, I did.

Q. Now, on the left-hand side, is that a map of the EUR study area that Endurance presented at the meeting in November?

A. This is the map they used in the November study, correct.

Q. And did they represent at that time that their study included all the wells shown on here in this eight-township area?

A. That's correct.

Q. In observing the wells that they included on here, were there a couple of wells that you noticed that did not fit even in the 2nd Bone Spring criteria?

A. Correct. As Ken Schwartz testified earlier, the first thing we need to do is make sure we're looking at the same geologic interval. So right off the bat, we identified one particular well, the Mad Dog 35. It's actually a 3rd Bone Spring well. That's a well Chevron has an interest in, so we have confidence that this is not a well that's in the interval that we're discussing.

Additionally, they identified kind of a hybrid diagonal trajectory well that for purposes of evaluating north-south versus east-west doesn't really offer much for this evaluation.

Q. Now, did you take, then, their map and create the depiction that we see on the right-hand side of this exhibit?

A. That's correct. So using the stick-figure map that they provided to us, I looked through public databases and constructed our own map basically to find the same wells that were analyzing the same area. So what you see on the right map is Section 18, the red dot with the blue circle around it. You see east-west wells that are identified in yellow and green wells that are

the north-south wells.

Q. And those are the same wells, then, that Endurance had in their study with the exception of the 3rd Bone Spring well and the diagonal trajectory?

A. That's correct.

Q. And this study covers a large geographic area; does it not?

A. I believe. If you count, there are roughly eight townships represented.

Q. Does such a large -- in your opinion, is it appropriate to conduct an EUR study for such a large geographic area?

A. If you have sufficient well count, then I would say yes, but in the situation we have at present, with 42 wells, for the hundreds of square miles that are represented here, I would say no.

Q. Did you then take these wells and begin to analyze them for purposes of understanding Endurance's EUR study?

A. Yes, I did.

Q. Turn to what's been marked as Chevron Exhibit Number 24. Why don't you explain to the Examiner what you did here with those wells starting on the left-hand side and then moving to the right?

A. These plots are identical, with the exception

that they're looking at two different sets of wells. So the left-hand side describes the north-south trending wells in the analysis. The right side shows the east-west wells. For both charts, the scale on the left is operating oil rig in barrels per day. The right y-axis is number of producing wells, so essentially a well count. Both of them are running off of normalized time on the x-axis.

What you see on the left-hand side, in the north-south analysis, is all 30 wells normalized to a maximum IP. From that, we see the wells trending off to the right as time progresses, and as history runs out for each individual well, we see this black line, which represents our well count, dropping off significantly. So if you follow the black line, you see at month zero we have 30 wells. And, for instance, at six months of production, we're down to approximately 13 wells. By the time you get to 12 months, you're down to seven wells.

EXAMINER EZEANYIM: Okay. Excuse me. On this Exhibit 24, did Endurance prepare this chart, or did you do it?

THE WITNESS: These are my charts.

EXAMINER EZEANYIM: Why do you call it Endurance?

THE WITNESS: It's just the way that I categorized them in my software.

EXAMINER EZEANYIM: Well, because it was confusing to me. Did you get this information from Endurance? So I wanted to know who prepared these charts.

MR. FELDEWERT: So let me address that.

Q. (BY MR. FELDEWERT) If we go back to Exhibit 23, Mr. Sigmundik, if we look at the wells on the left-hand side or on the right-hand side, it's basically the same well set, correct?

A. That is correct.

Q. And then you took that well set from Exhibit 23 and then charted them in Exhibit 24; is that, correct?

A. That's correct.

EXAMINER EZEANYIM: Is that 24 and 23? Those wells in 23 and 24, where are the wells?

THE WITNESS: So the wells that we are discussing are the same wells that Endurance included in their analysis. They're the wells that you see on Exhibit 23. Those 40 wells -- 42, minus the two, are the wells that are considered in the curves that you see on Exhibit 26 -- 24.

EXAMINER EZEANYIM: On Exhibit 24, you did the work, right?

THE WITNESS: Yes, sir. This is my work.

EXAMINER EZEANYIM: You did the work, but you decided to call it Endurance?

THE WITNESS: That's correct.

EXAMINER EZEANYIM: What's wrong with calling it Chevron?

THE WITNESS: I just categorized -- this is how I categorized it.

EXAMINER EZEANYIM: Well, you can call it anything, but it puts me off. See, I was thinking maybe Endurance gave you their study. And, you know -- I'm sorry.

MR. FELDEWERT: I think the way to look at this, Mr. Examiner, is Exhibit 24 does analysis of the wells that Endurance chose to use in their EUR. That's why he named it Endurance.

EXAMINER EZEANYIM: Okay. That's very important.

MR. FELDEWERT: These are not the wells that Chevron chose. These are the wells that Endurance chose.

EXAMINER EZEANYIM: Okay. So we are going to get an identical study now from the same wells.

MR. FELDEWERT: We're going to get -- we're going to get to that. We have our own study. We're

just trying to show you what their study did, so you can compare it to Chevron's study.

EXAMINER EZEANYIM: Okay. Could you go back and explain what you said, because I was wondering. I said, This is not your exhibit; it might be for Endurance. What did you do? Tell me what you did. You described it before, but I want to hear it again.

THE WITNESS: Sure. As we mentioned earlier, the area of interest that we're studying is 40 wells. There were 10 east-west wells. There were 30 north-south. That's where -- that's what you see visible on these charts. On the left chart, you see those 30 wells' production history. On the right side, you see the 10 east-west wells and their production history.

So, again, the key thing to look at in this exhibit is this black -- dark black line. This is the well count of a number of producing wells at each increment of normalized time.

Q. (BY MR. FELDEWERT) Now, why, Mr. Sigmundik, is it important or why did you emphasize how many of the wells that Endurance chose to use were producing at the 12-month period of time?

A. So when you're conducting decline-curve analysis, this is derived from the Arps equation. So

you have a B factor. You have an initial point, as well as the decline. And as we know for unconventional type resources plays, whatever you'd like to call them, you need a significant amount of production history to understand the late-time effect of what the well is doing further out into its well history.

The reason I've selected 12 months is that is our Chevron-internal normalized standard of what we assess or what we claim to be an appropriate length of time before we conduct an EUR study.

Q. Is it also a study that other petroleum engineers use?

A. It's a recommended standard. There have been plenty of Society of Petroleum Engineers papers that attest to the importance of understanding late-time effects.

Q. So when you take a look at all of the wells that Endurance chose to include in their EUR study over this broad geographic area, how many of the wells that they chose to use end up with production at 12 months or beyond?

A. Again, if you are looking at the Exhibit and you follow the blue arrows, you see that the north-south wells have seven wells that meet the 12-month criteria.

Q. Let me stop you there. You got that because

you've got your black line intersecting your blue line on the left, and if you go to the right, that's the number of wells that are producing at 12 months?

A. Correct.

Q. And that's for the north-south wells?

A. That's also right.

Q. And if I go to the right side, you're examining the wells that they used that had an east-to-west orientation?

A. Yes.

Q. And at 12 months, how many of those wells that they started with are still producing at 12 months or longer?

A. There were five.

Q. Only five. So let's keep that in mind. We have a total, then, of -- all the wells they chose --

A. 12 wells.

Q. -- only 12 wells have a production history of 12 months or more?

A. That's correct.

Q. Now, with that in mind, let's turn to Exhibit 25. And what did you then do with the 12 wells that had the minimum of 12 months of production?

A. So this is a similar map to what we've seen earlier. It's the same data set, the same wells. I've

circled or highlighted or bubbled around the 12 wells in question that met this 12-month criteria. So, for instance, at the top area of this map, you see four or five wells that have met the 12-month criteria.

Q. Okay. So let me stop you there. Of the east-west wells that Endurance analyzed, four of the five that had 12 months of production or more are located to the north of Section 18?

A. That's correct.

If you look -- again, we've color-coated the wells based on trajectory, so east-west wells are yellow wells. You count that four of the five wells that did have 12 months of history are isolated, as well as north of our Section 18.

Q. And if I look on this exhibit and locate Section 18, it's the area that has the red circle with the strike line through it?

A. That's correct.

Q. That's our Section 18.

If I go up -- one, two, three, four, five, six, seven, eight -- nine, I encounter the first east-west well that they used in their analysis that had at least 12 months of production?

A. That's correct.

Q. And then I continue, 10, 11 and 12. I hit the

next one, and then I go up to 15 and hit another one?

A. All those statements are correct.

Q. Then what did you observe with respect to the seven wells that met the 12-month criteria that were north-south oriented?

A. So if you again look at the map, you identify that -- or, again, looking at seven wells -- and these are going to be colored in the dark green -- you identify one that is extremely to the north. I believe that's 15 miles away. And then the remaining six are located to the south and west of Section 18, and they're all clustered together.

Q. So six of the seven north-south wells that met the 12-month production criteria are all clustered down to the southwest of Section 18?

A. That's correct.

Q. And is that more of a developed area?

A. You would assume so considering the well count in that area.

Q. Are the wells in that particular area high-performing wells compared to the wells to the north?

A. Yes, they are.

Q. So what does that tell you with respect to their EUR study?

A. So if you were looking at an EUR study and you're basing it off of the decline of the wells that have significant production, you could make the conclusion from this data that the wells that were analyzed in the north-south trajection are in a developed area that has preferential geologic attributes and would therefore have better production.

My conclusion from the Endurance study is that it is more so a study of geology than it is a study of east-west versus north-south trajectory.

Q. Because it's biased to an area of high-performing wells?

A. That's correct.

Q. And those high-performing wells in that developed area, you saw both stand-up and lay-down wells that are high performing in that area?

A. That's correct.

Q. Yet only one of the five wells that they included in their analysis with 12 months of production existed in that well-developed area?

A. That's correct.

Q. The rest of the lay-down wells in their analysis was way to the north?

A. That's correct, in a poorer-performing area.

Q. Now, in addition to that bias that we see in

their study -- let me ask you: You said there were -- if you look at the entire study, there were only 12 wells in this eight-township area that had 12 months of production or more?

A. That's correct.

Q. In your opinion, is that a sufficient number of wells to conduct an EUR study that includes such a broad geologic area?

A. When you consider the range of EURs -- and you could even quote Endurance's range of 130 up to 500,000 standard barrels. The well count at 40 is insufficient for a study area of this size, and when you reduce that count to 12, it's certainly insufficient.

Q. Are there standards that are published by a society that you look to when you do an EUR analysis?

A. I referred earlier to the Society of Petroleum Evaluation Engineers, the SPEE. They have produced or published what they call Monograph 3, which explains some basic guidelines for well count with regard to analysis of these tight resource plays.

Q. And those standards that they've published, what are they for? What are they used for?

A. They're to ensure that from company to company, their reservoir engineers are using similar standards with regard to how they book reserves, and that directly

relates into stock price. So you want some consolidation amongst different companies of how reserves are estimated in these resource plays.

Q. And so these guidelines assist in determining how many wells you would need within your study based on how large a geologic area is that you're dealing with?

A. To a proxy, yes. The larger your geographic area, the more variation you're going to get in EUR outcome. The larger that variation in EUR outcome, the more well count you're going to need to have confidence in the estimates that you're pumping out.

Q. And did you look at those guidelines before this hearing?

A. Yes, I did.

Q. And did you apply those guidelines to this eight-township area that Endurance included in their study?

A. Yes, I did.

Q. And based on those guidelines, approximately how many wells should a company have within their study to meet these standards?

A. You would need approximately 100 wells.

Q. And Endurance started with 40?

A. That's correct.

Q. And by the time you got to 12 months'

production, they were down to 12?

A. That's also right.

Q. Given the unique nature of Section 18 here, do you think this particular EUR study has any use for the trajectory issue that is before the Division involving Section 18?

A. For two reasons, I would say no. Again, we recall from Ken's outline that we're on an anticline in Section 18. Meaning that most of these EUR studies that we're conducting are relatively useless. In addition to, that the study that we've conducted doesn't have enough well count to have any confidence in the expected value of the outcome of an EUR study.

Q. You're talking about the study that Endurance conducted?

A. That's correct.

Q. You were advised, were you not, at the pre-hearing that the Division requested, to the extent possible, that the companies present an EUR analysis to the Examiner, correct?

A. That's correct.

Q. Did Chevron attempt to go out and find an area that would be potentially suitable for an EUR analysis that was somewhat close to the area in question?

A. Yes, we did.

Q. And did you -- first off, did you go out and try to find an area with an anticline like we see in Section 18?

A. We did, but we were unsuccessful.

Q. So then what was the area that you could find, you know, within a reasonable length or distance from the subject area that perhaps yielded itself to some type of EUR study that would compare the performance of north-south wells versus east-west wells?

A. When you reduce the geographic area, you also reduce the uncertainty in several of the variables, such as thickness, porosity, permeability, et cetera. So by shrinking an area, we were able to come up with an area of analysis that would be acceptable for an EUR analysis.

Q. So you found an area that similar geology?

A. Correct.

Q. Similar completion techniques?

A. Correct.

Q. Similar lateral length?

A. Correct.

Q. And in the same zone that you're dealing with here?

A. Yes.

Q. So you did an apples-to-apples comparison

between north-south wells and east-west wells?

A. Yes, sir.

Q. If I turn to Exhibit 26, does that identify the area that you were able to locate that met that criteria?

A. Yes. If you look at the left side of this particular exhibit, you see a blue box that's around a smaller portion of the wells from Endurance's study.

Q. Okay. So let's get oriented there. Within that blue box that you see on the left-hand side of this exhibit, there is an area shaded in blue that has a red dot in it with a line through it. That's Section 18?

A. Again, that's Section 18.

Q. And is the area, then, to the west and southwest of that is what you studied?

A. Yes.

Q. That's a much smaller geographic area?

A. Yes, it is.

Q. All right. Now, with that in mind, did you then do a blowup of that particular study area to the right of this exhibit?

A. That's correct.

Q. First off, what do the colors on these wells to the right of this exhibit and these bubbles indicate? What do the colors indicate?

A. Let's talk through this. Again, we see Section 18 is our circle with a dash through it on the right-hand side of this map. The bubbles are colored based off of completion year. So we had one well that was completed in 2011, a handful completed in 2012 and the remainder completed in 2013. The bubbles are sized based on the maximum oil initial production. So for a month, the highest IP. So this gives us an estimate of the kind of natural drive of the reservoir, the producibility of the reservoir.

Q. Now, this particular area studied, in addition to being smaller geographically, is, what, three to seven miles from Section 18?

A. Correct.

Q. And what you see here -- it looks to me like, if I look at the size of the bubbles --

A. Yes.

Q. -- that there is even a distinction between this particular study area.

A. Yes. Even in this smaller geographical area there is still variation in the production of these particular wells.

Q. So did you find -- were you able to then -- did you essentially split the study area to account for the variations in maximum oil initial production that you

see on here?

A. I did. And if we proceed on to Exhibit 27, you'll see the outline of those two particular areas.

Q. So this is the same map as in Exhibit 26?

A. It is the same map with the exception that we're now looking at a three-month cumulative oil bubble chart.

To again talk you through, we're looking at the same blue box, and as we see -- similar to our IP chart, we see the majority of our larger bubbles are again occurring in what I've now labeled the tier area, and our smaller bubbles I've circled and labeled as a core area. So this particular map correlates with Chevron's internal analysis of well producibility. So we take into account a well's production, as well as its geologic features, such as porosity and net thickness, to determine a core versus a tier area.

Q. Okay. So now in the tier area, for example, it looks like you have a grouping of wells in which you have a mixture of north-south and east-west, correct?

A. That's correct.

Q. And if I look at your core area, again we have a grouping of wells that seem to have similar production capabilities that, again, have some in the north-south -- actually, most are north-south and some

are east-west?

A. Correct.

Q. Now, keeping in mind your tier area and the core area, did you first analyze the tier area to see what type of performance you were seeing based on trajectory?

A. I did.

Q. And is that set forth in Exhibit --

A. Should be 28.

Q. 28.

A. Correct.

Q. And what do you see -- now, this is the study of your tier area?

A. Correct.

Q. Explain to us what you did in the left-hand side of this exhibit in the blue box.

A. Sure. So the wells that are evaluated in this tier-area analysis are the wells that are highlighted in yellow on the map to the left. It's the same wells that are in our green-boxed area from the previous exhibit. When you analyze those wells and plot out the production curves of each individual well, we were able to attribute a P10, a P50 and a P90 analysis, meaning a low case, a mid case and a high case, for the wells that were in question.

So when we fit a decline curve to that P50 line, which would be considered an average well for this tier area, we result in an EUR estimate of 414,000 standard barrels of oil, an expected well life of 31 years 5 months, with the Arps equation constance of B factor of 1.163. And I used a minimal decline percentage 10 percent.

Q. Okay. Now, let me ask you a couple of questions about this tier area that you studied. Within this tier area, there are a number of north-to-south wells, correct?

A. The majority of them are north-south.

Q. And how many of those wells are east to west?

A. There were two.

Q. Only two?

A. Yes, sir.

Q. Looking at the legend on the right-hand side, which wells are the east-to-west wells in this tier area?

A. Those would be the Macho Nacho State 3H and the Macho Nacho State 1H wells.

Q. So that would be the first well listed and the third well listed?

A. Correct.

Q. And then there is the color line associated

with each of those wells?

A. That's correct.

Q. So if you wanted to, you could go onto this map and follow that color line and see how it compared to your P50 line; is that right?

A. You could. And, unfortunately, it gets a little bit jumbled and messy in this particular plot.

Q. Okay. Now, with respect to the EUR that is calculated there, your quantity of 414,000 --

A. Yes.

Q. -- is that the average EUR for these wells?

A. That's the average for all of the wells, north-south and east-west.

Q. That would be P50, essentially?

A. P50.

Q. With all that data, then, in mind, focusing on this smaller tier area, were you then able to compare how the east-west wells compared to north-south wells in this area -- in this developed-grouped area?

A. I believe if we flip onto the next exhibit, we'll see just that.

Q. Now, first off, we have two graphs here. What does the graph on the left reflect?

A. So, again, I'm looking for things that are concrete, not EUR projects. I'm looking at concrete

data of what was the maximum IP and the three-month and six-month cumulatives for these particular wells.

So what you see on the left chart is the wells that were included in this tier analysis rated [sic] out based on their maximum initial production of oil rate. So from what you see on this particular plat, I've identified which two wells were our east-west wells in this tier area, the Macho Nacho State 3H and 1H. I've placed blue boxes, and I've also made the bars red. What you see from this particular analysis of IP is our two east-west wells. We're in the top percentile of producibility from an IP standpoint.

When you look to the right-hand side of the chart -- or the right-hand side of this exhibit, you see the three-month and the six-month cum oil. And, again, I've identified which two wells are the east-west wells in this particular tier area. The Macho Nacho State 3H and 1H were both the top performers at three-month intervals and were within the top percentile on the six-month interval.

Q. So based on this EUR study for this similar depositional environment that we have in the tier area, this reflects that the east-to-west wells outperformed the north-to-south wells?

A. I think it's worth mentioning that they not

only outperformed, but if you look at the north-south wells, they were also the least performers as well.

Q. Did you then also take a look at the data that you have in this smaller tier area with respect to the overall EUR estimate?

A. Correct. So if we take a look now at Exhibit 30, we see a cumulative oil production chart. So the left axis is cumulative oil production, 1,000 barrels per day -- or thousands of barrels, and the right axis -- or the x-axis is normalized time.

So, again, I've placed our P10, P50, P90 EUR type curves on this plot for reference. I've also identified our two east-west wells with a blue and a green star for easy reference.

What you take away from this chart are two east-west trajectory wells on a cumulative basis, looking at all the available production history, we have our top performer that's producing better than our P10, and our other east-west well is performing above P50. And if you wanted to rank them out, it would probably be third or fourth overall.

Q. So both of the east-west wells in this tier-study area, where you have a lot of development, were above the average EUR line for all of the wells in that section --

A. That's correct.
Q. -- that area?
A. Yes.
Q. That common area.
And if I'm understanding this correct, Mr. Sigmundik -- correct me if I'm wrong -- does that mean, based on the analysis, that those two wells should recover more oil than the north-south wells in this tier area?
A. That would be a logical conclusion, yes.
Q. Now, our data's limited; is it not?
A. It is limited, yes.
Q. But we took the available data you had in a common area?
A. That's correct. So, again, backtracking, what we did is we found an area where we had the greatest confidence that geology was similar, completion methods were similar, lateral lengths were similar and production methods and completion methods were all similar. And when that study was conducted, it seemed that east-west is our best performance.
Q. Now, taking advantage of this area that's fairly close to Section 18 -- let's go back to Exhibit 27, please. Let's keep a finger here. Keep a finger here, and flip back to Exhibit 27. Now, the analysis

you just went through is for the tier area outlined in green, correct?

A. Yes.

Q. Now, you notice that even within your study area, there seemed to be a different depositional environment?

A. Correct.

Q. Which you identified as the core area?

A. Correct. Within our blue box, we were still able to separate out a core in a tier area.

Q. Now, for those -- one, two, three, four, five, six, seven, eight -- nine wells in this core area, did you do a similar analysis?

A. Yes, I did.

Q. Let's go to Exhibit 31. First off, Mr. Sigmundik, if I -- consistent with what you did before, if I go down on Exhibit 31 and look at that blue box in the bottom, left-hand corner, I now see a different set of wells highlighted in yellow?

A. That's correct. Those wells highlighted in yellow are the ones that are included in this ensuing analysis.

Q. And did you do, then, the same analysis for that set of wells as you did for the tier area?

A. Correct. I again sent out a P10, P50 and P90

estimate for production -- for the production curve and fit a best fit to the P51. The result of this particular study in the core area -- which I'll remind you is, from a geologic standpoint, poorer performing with regard to porosity. The EUR estimate was 122,000 barrels, an expected well life of 20 years 7 months, with a B factor from Arps equation of 1.3, using a minimal decline of 10 percent.

Q. So you have less estimated ultimate recovery and a shorter time life for this set of wells because they're in a less-productive area, essentially?

A. That's correct.

And I guess I'll throw in one other crucial piece of information. Our end-of-well-life cutoff is at three barrels per day.

Q. All right. Now, first off, before we move to the next exhibit, which of this grouping of wells -- can you identify the wells that are east-to-west oriented within this small -- within this study group?

A. That would be the Trucker BRK State, which is kind of a grayish-blue.

Q. That's the fourth well down on the legend; is that right?

A. That's correct.

And the Macho State well, which is a blue

well that is approximately seven down.

Q. I count nine; is that right?

A. Oh, sure. Nine.

Q. Nine down, the Macho State, blue line?

A. Yes.

Q. Those are your two east-west wells?

A. Right.

Q. The rest of them are north-south?

A. That's correct.

Q. Now, with that in mind, having conducted your analysis, let's turn to Exhibit 32. And is this similar for this -- what you call the core area, the less-performing area? Do you see a similar result when you compare the two east-west wells with the north-south wells?

A. Yes. You'll recall this is similar analysis to what I did in the previous exhibit. You see maximum oil initial production in the left chart barred out, and the right chart is three-month and six-month cum where available also barred out.

I've also identified the two east-west wells in this investigation area by putting them in blue boxes. And, again, we see the two east-west wells, the Macho State and the Trucker BRK State, performing at the top percentile both in the maximum IP category, as well

as in the three-month and six-month cums.

Q. And the flip side of that is that the lowest-performing wells were the north-south wells?

A. That's correct.

Q. Now, to be fair, there were a couple north-south wells that did fairly well?

A. That is true.

Q. But with respect to the two east-west wells, you said they're in the top percentile?

A. Correct.

Q. Then if I turn to Exhibit 33, is that a similar EUR estimate for this particular core-study area?

A. Correct.

So, again, cumulative oil is on the left-hand side. X-axis is time. The red-dotted line represents our P50, what we use to conduct our EUR analysis. That would be average. And, again, I've identified our two east-west trajectory wells using stars. So we again see one of our top performers. I believe would be second overall is the Macho State 1H, and then, additionally, the Trucker BRK State is performing with the blue star.

Q. Now, going through this EUR study, in your opinion, an EUR study like Chevron did, and even like Endurance did, does it add much to the analysis with

respect to Section 18?

A. As we've discussed before, because of the Antelope Ridge anticline, Section 18 is a unique area, and this EUR analysis, either Endurance's or my own, really doesn't offer significant evidence with regard to lateral trajectory in Section 18.

Q. But if you're going to do an EUR study, then you want to find an area that has similar geology, similar time frame and wells, similar completion?

A. That's correct.

Q. And that's what Chevron did?

A. Yes, we did.

Q. In that area, that's only three to seven miles away from Section 18, and you found that the east-to-west wells outperformed the north-south?

A. Yes, we did.

Q. Now, getting back to Section 18, the anticline here, as the petroleum engineer here, given the anticline that we have and the natural fractures that we have within that area, what is your opinion as to how the wells should be oriented in that Section 18 area?

A. You obviously want to complete -- or drill your well in a trajectory that's perpendicular to the natural fractures. As Ken Schwartz has already testified, because of the nature of the anticline, those natural

fractures are most likely to be in a north-south orientation, meaning that the preferred trajectory of a well in Section 18 would be east-west.

Q. And you are a petroleum engineer, and you heard testimony that an east-to-west trajectory would also line [sic] with toe-up, correct?

A. That is also correct, given the structure of the 2nd Bone Spring in Section 18.

Q. And is that preferable when you're trying to drill a commercial well?

A. Yes, it does. By drilling toe-up, it allows the fluids that are being produced to fall back to the heel, where artificial lift is most efficient, and being able to lift those fluids to the surface.

Q. In your opinion, will the granting of Chevron's application be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes, it would.

Q. Were Chevron Exhibits 22 through 33 prepared by you or compiled under your direction and supervision?

A. Yes, they were.

MR. FELDEWERT: Mr. Examiner, I'd move admission into evidence of Chevron Exhibits 22 through 33.

EXAMINER EZEANYIM: Any objection?

MR. PADILLA: No objection.

EXAMINER EZEANYIM: Exhibits 22 through 33 will be admitted.

(Chevron USA, Inc. Exhibit Numbers 22 through 33 were offered and admitted into evidence.)

MR. FELDEWERT: That concludes my examination of this witness.

EXAMINER EZEANYIM: Thank you very much.

Mr. Padilla?

CROSS-EXAMINATION

BY MR. PADILLA:

Q. Mr. Sigmundik --

A. Sigmundik. Close enough.

Q. Sigmundik. Sorry. Did you use any well data in any of your studies from any of the Endurance wells in Section 19?

A. The data that was available to me were wells that Chevron has interest in and publicly available data, so we're talking getting it from the State or his. So Section 19 well is not -- Chevron doesn't have an interest in. Therefore, we would not have an EUR study.

Q. Do you know when that well was completed?

A. No, I don't.

Q. So it's not included in your study at all, right?

A. That's correct.

Q. So you have no idea of what the IP for that well is?

A. No, I don't.

Q. How about the Stratocaster well in Section 20?

A. That well -- what's the full name of that particular well?

Q. Stratocaster 1H.

A. Would it be the Stratocaster 20 1H?

Q. That's probably right.

A. Yes. I believe that well was both in your analysis and mine.

Q. Where is it shown in your analysis?

A. Let's see. That was, I believe, Exhibit 23.

MR. FELDEWERT: Yes.

A. That would be -- if you're looking at Exhibit 23, that would be the red well that's located to the immediate south and east in Section 18.

Q. (BY MR. PADILLA) Did you have an IP for that well?

A. It was available, but for the purposes of my core and tier area study, I didn't include it. As I mentioned before, my study was focused on wells that had

significant production, and that Stratocaster well had a few months of production, not many.

Q. It had at least a one-month period, right, of initial production?

A. It did have an IP.

Q. And it did have at least a 90-day period of production, right?

A. I don't recall.

Q. Did you selectively delete this well from your study in terms of IP?

A. In terms of IP, yes.

Q. Do you know whether this well, IP, did 1,300 barrels per day?

A. Sounds like you do.

Q. Well, do you know? That's my question.

A. No, I don't.

EXAMINER EZEANYIM: Interesting.

Q. (BY MR. PADILLA) Would this information be in public data?

A. If the well is on production for more than, I think, four months or so, then, yes, it would be.

Q. Assuming this well, IP, the 1,300 per day, what kind of a bubble size would that have?

A. I reckon it would be about the same size as some of the wells that were investigated in the tier

area.

Q. Big bubble or little bubble?

A. We're talking big.

Q. Do you know the IP for the Endurance Stratocaster 3H in Section 20?

A. As much as I wish I were a walking Excel spreadsheet, I don't know that number.

Q. I'm not asking you for a smart-ass kind of question -- or answer. I'm just asking you whether you know it or don't.

A. For that particular well, it's probably a -- it's probably included in this analysis.

Q. But you didn't include that in your study, right, that well?

A. No.

Q. Would it surprise you that well IP'd at 1,100 barrels per day?

A. No.

Q. Would that be a big bubble or a little bubble?

A. Big.

Q. In Section 29 -- did your investigation include any of those wells in Section 29?

A. Could you help me identify Section 29 on this map?

Q. We've talked about the Caza well this morning.

Did you include the Caza well in your study?

A. No. That well wasn't in Endurance's initial analysis, nor is it in mine.

Q. Does Chevron own a part of that well?

A. Yes, it does.

Q. And you're telling me you don't know the IP of that well?

A. No, not in front of me.

Q. So, again, you chose those wells that would favor your presentation here today, right?

A. I chose wells that would best represent an east-west versus north-south analysis.

Q. How many wells has Chevron drilled in this area -- I mean drilled and is actually operating?

A. I don't know off the top of my head.

Q. So when did you begin your study here for today's presentation?

A. This study was conducted once we found out that this particular case would be going to this hearing.

Q. So is it fair to say that you began maybe sometime in January?

A. That's correct.

Q. And you base your study solely to refute the presentation that Endurance gave to you on November 20th of last year, right?

MR. FELDEWERT: Object to form of the question. I think he testified he did it for the hearing.

EXAMINER EZEANYIM: Are you raising an objection?

MR. FELDEWERT: I am.

EXAMINER EZEANYIM: I would require you to rephrase the question.

Q. (BY MR. PADILLA) So in your presentation today, you're refuting the presentation that was made to Chevron on November 20th, correct?

A. Yes.

Q. And you started this presentation sometime in January solely to refute what was presented to you as a well proposal, correct?

A. The intention was to use a similar data set and come up with reasonable conclusions.

Q. So did you at any time present any data to Endurance showing that an east-west well was more favorable?

A. No, I didn't.

Q. In fact, Chevron presented nothing to Endurance on November 20th or any other time. Is that fair to say?

A. I believe as Mr. Schwartz already answered, in

your cross-examination, that Chevron and Endurance were already in a contested relationship with regard to leases, so, no.

Q. But despite that, Endurance did present a number of slides to you containing geologic information, and that's --

A. I'm really sorry. You're going to have to restate the question. I'm hearing rattling from outside.

Q. I think my question was that Endurance did present to you geologic information and, of course, their IP study to try to convince Chevron that a north-south well was better?

A. I believe Endurance -- they did show us maps, and they provided an EUR study. I'm not familiar with any IP study.

Q. Well, EUR -- they did present an EUR?

A. Yes. It was an EUR study.

Q. My question to you is: Did Chevron at any time present anything to Endurance to try to convince Endurance that an east-west well was more favorable?

A. No.

Q. How did you categorize this land in Section 18, at least the 2nd Bone Spring, as unconventional?

A. That's based on the porosity, as well as the

permeability here in the rock itself. From a basinwide perspective, this rock is in the micro- and nanodarcy levels. It requires long laterals, with frack stimulation to produce.

Q. So when we speak of unconventional, that's a term of art; is that right?

A. A term of what?

Q. Of art, a classification of some sort.

A. Yes.

Q. And it's based on thickness or -- what is that based on? Millidarcy?

A. Like I said, an unconventional resource is a resource that cannot be predictive from a single -- a single well or even a small group of wells. You need to consider an entire basin or a specific target area with the sufficient well count to fully understand the broad range of outcomes.

Q. Now, your study -- and I'm not sure that I should use the word "criticize," but it criticizes the total number of acreage in the map that Endurance showed you, that was presented to Chevron, yet Mr. Schwartz this morning was testifying about having a basinwide study of the Bone Spring anywhere from north to south all over southeast New Mexico. And you seem to be now saying that it's got to be more refined; is that,

correct?

A. When you understand that the principal stress is changing throughout the basin, then for purposes of identifying where to drill a well, how to drill a well, you do want to take into consideration wells that are similar. You want to take into consideration wells that are closer.

Q. Did you do any stress-orientation studies at any time involving the drilling of your well -- your proposed well?

A. No.

Q. Is stress orientation important?

A. Especially when you're on an anticline.

Q. It's important at any time you're drilling Bone Spring wells. Wouldn't you agree with me?

A. Yes, and especially when it's on anticline.

Q. But you did not do any type of stress-orientation studies even though you contend your proposed well is going to cross an anticline, right?

A. I'm not an expert in geology. I believe Ken has already testified to our sentiments and our interpretation of the geology in Section 18.

MR. PADILLA: That's all I have, Mr. Examiner

EXAMINER EZEANYIM: Thank you very much.

Anything further?

REDIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Sigmundik, in your opinion, is one month of production enough for any EUR analysis?

A. An IP is a poor correlation to EUR.

Q. And having one well in a particular section, is that enough for a study of an EUR?

A. No, it isn't.

Q. And, in fact, I guess it goes to say there is nothing to compare; is there not? You just have one well.

A. No.

Q. The area that you focused on for your study, was it an area that had a number of developed -- a number of wells?

A. Yes, it did.

Q. And different orientation?

A. Yes, it did.

Q. And once you had enough wells to at least compare how the performance is being done?

A. Yes.

Q. And similar geologic setting?

A. Correct.

Q. In which were drilled about similar time

frames, correct?

A. Correct.

Q. And that's why you chose your study area just to the southwest of Section 18, because it met the criteria?

A. Yes, that's correct.

MR. FELDEWERT: That's all the questions.

EXAMINER EZEANYIM: Mr. Padilla, anything else?

MR. PADILLA: Nothing.

EXAMINER EZEANYIM: For goodness sake, I hope the 2nd Bone Spring is not an unconventional resource play. I'm going to be very unhappy if it is, if that 2nd Bone Spring is unconventional.

Has anybody calculated the mobility ratio here in the Bone Spring? I mean, it should be prolific, as far as I know. So anyway, that's -- but I just don't want it to go to unconventional. It's not for anything anyway.

CROSS-EXAMINATION

BY EXAMINER EZEANYIM:

Q. I think I'm going to -- in the interest of time, I'm not going to ask all the questions because I've gotten what I wanted. But I wanted to mention something to you, Mr. Sigmundik. Can you explain to me

your P10, P50 and P90. What is that?

A. It's -- to put it in perspective, it's a probability of percentile.

Q. Of what?

A. A percentile of the production curves. So if you had, for instance, ten wells, P50 would be the 50th percentile value of those. P10 would be the tenth most -- the top tenth-most percentile, and 90 would be the tenth lowest percentile.

EXAMINER EZEANYIM: You know we shouldn't be here if you guys have really -- you guys met for one-and-a-half hours in Houston, according to testimony this morning, but nobody wanted to really do any business. It was one-and-a-half hours for nothing. I thought at that meeting you presented to each other whether east-west or north-south would be better or not. But I'm hearing that you guys didn't even talk about it.

Then I begin to wonder, what did you talk about? I mean, what issues did you talk about? I am hearing that you never discussed east-west better than north-south. I don't know what you are talking about in that meeting. The first witness said that at the meeting -- you shouldn't be here if you had talked about it.

Okay. For interest of due process, you

mentioned, anyway, Mr. Sigmundik, that here you are, and I think I requested that information. It had nothing to do with this case, so I don't want to go back and examine your parameters, how you got porosity, the B factors and how you come up with 10 percent, because I can do my calculations, too. So I don't want to go there now, because -- that EUR doesn't mean anything. I think you guys are busy with your rendition of a natural fracture that you did and microseismic and decided to go east-west.

Q. (BY EXAMINER EZEANYIM) Do you have any interest -- I mean confidence in the EUR you calculated? Do you have any confidence in that?

A. I can say with confidence that if we drill -- actually, no.

Q. You don't?

A. No.

Q. Okay. That's my point. The point is you have it because I told you to do it, and you did. That's good. That's your testimony.

So now natural fractures. That's how you determine that east-west -- it would be a better orientation than north-south, right?

A. Correct.

Q. Not based on the EUR?

A. Correct.

Q. Then I don't have to go back and ask you all those questions, and we are running out of time. Anyway, we have about five testimonies to go. If there is anything that comes up, I will ask you. I've got tons and tons of questions to ask you, but I'm not going to because you have dismissed that evidence. So what's the point? If I want to know how you got 1.168 B factor or the other 10 percent, then I can equate that. So we can continue here, right?

A. We can.

Q. Is that okay?

A. Yes.

Q. Let me check and see if there is anything that might be --

Okay. Now, even when you did your EUR, you assumed exponential decline?

A. Correct. Once we reached a minimum decline of 10 percent, we set it to an exponential decline.

Q. It can happen, a hyperbola, when I look at, you know, some declines there. I'm not saying they are, but -- that's a different B factor or how to calculate EUR. Why I'm not going there? Because you don't put faith in your EUR. But that's fine.

I think we collect -- as agencies, we

collect information, and if you go to OCD online, you know, or something, even his, you can get production data from OCD online once the 90 days is over. There are some data we don't keep. I apologize. Like pressure data, we don't keep pressure data. You can get some oil production data from the OCD. People did not know that we have OCD online. I want to make sure you know that.

Did you try to find -- when you calculated it, did you try to calculate the original oil in place?

A. I didn't make that calculation, no.

Q. You didn't. Okay. So we don't know how much to extrapolate from the oil. Okay. But then you have your EUR Form 414?

A. 414.

Q. And decline, right? Decline --

A. Decline analysis [sic], yes.

Q. Porosity is 8 percent? Average porosity is 8 percent?

A. I'd have to defer to the geologist on that.

Q. I think I heard it from him.

Okay. Like I said, in the interest of time, you can step down, and let's hear from the other side.

EXAMINER EZEANYIM: Do you have anything?

MR. FELDEWERT: I have two more questions. I just don't want the record to be confused on one point.

EXAMINER EZEANYIM: Okay.

REDIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Sigmundik, I think you answered a question from the Examiner, and you said no confidence.

A. Yes.

Q. Now, let me ask you something. With respect to the EUR analysis that you did for your tier area and for wells within that particular geologic setting, do you have confidence in your EUR study and your comparison for that particular geologic area?

A. Yes. The reason for that is within the smaller geologic area, there is less variability in low case versus high case. Because there is less variability, there is more certainty in an outcome when you do drill a well.

Q. So do you have confidence in the EUR study that you did for that particular area?

A. I'm saying if I were to drill or if Company X were to drill an oil well in the 2nd Bone Spring within our tier area, I have confidence that the outcome would be that particular expected value, the P50 value that I

calculated.

Q. And then with your second core area or the second area you analyzed, which had its own geologic setting, you have confidence in what you did there?

A. Yes.

Q. When you said no confidence, what did you mean by that?

A. No confidence as in -- I interpreted the question as to drill a north-south well or an east-west well. For instance, I were to drill an east-west well, I'm essentially doing the analysis basing my outcome on two data points. It would be like rolling a dice twice and then being asked to predict what the outcome of the third roll was going to be.

Q. And then do you have -- when you said no confidence, do you have any confidence that any of these EUR studies, whether the one Endurance did or the one you did, has any real bearing on the proper orientation for a well in Section 18?

A. No.

Q. And is that because of the unique geologic feature that is associated with Section 18?

A. Yes.

Q. That's all the questions.

EXAMINER EZEANYIM: Anyway, I don't have

any more questions for you now.

THE WITNESS: Thank you.

EXAMINER EZEANYIM: You can step down.

How many witnesses?

MR. PADILLA: We have five witnesses, and we'll move through them as fast as we can.

EXAMINER EZEANYIM: You want to start with the engineer?

MR. PADILLA: I can.

EXAMINER EZEANYIM: You sure? Because it's up to you.

(Discussion off the record.)

RANDALL HARRIS,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. PADILLA:

Q. Mr. Harris, state your full name, please.

A. My name is Randall Harris.

Q. Mr. Harris, you've been qualified as a petroleum geologist before the OCD before, right?

A. Yes, I have.

Q. And are you familiar with the drilling prospect that Endurance has in this presentation today?

A. Yes, I am.

Q. Have you prepared certain exhibits for introduction at this hearing?

A. Yes, I have.

MR. PADILLA: We ask that Mr. Harris be qualified as a petroleum geologist.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: All right. Mr. Harris is so qualified.

Q. (BY MR. PADILLA) Mr. Harris, let me have you --

MR. PADILLA: Well, first of all, if I may approach the witness?

EXAMINER EZEANYIM: Okay. Sure.

Q. (BY MR. PADILLA) Mr. Harris, I've handed you a seismic picture that Endurance presented, and would you please identify that page, what exhibit that may be, for the record, the Chevron?

A. The Chevron? It is --

Q. There's a tab before that, I believe.

A. It's the east-west cross section through Section 18, Exhibit Number 14.

Q. Mr. Harris, Mr. Schwartz testified at length this morning about an anticline pretty much on Section 18 that was being very unique. First of all, I want to ask you whether you agree with that assessment.

A. No, I do not agree. It is not an anticline. It is a drape feature over a deep-seated fault.

EXAMINER EZEANYIM: Which exhibit are we looking at? For Chevron [sic], Exhibit Number 14?

THE WITNESS: And also Exhibit Number 5.

EXAMINER EZEANYIM: For Endurance?

THE WITNESS: For Endurance.

EXAMINER EZEANYIM: Please let me know where you are, so I can follow.

THE WITNESS: And I'll start with Exhibit Number 5.

May I begin?

Q. (BY MR. PADILLA) Go ahead. Describe Exhibit Number 5. What is it, to begin with?

A. Exhibit Number 5 is a contour map on the top of the 2nd Bone Spring Sand. It's contoured on a 20-foot interval. The previous testimony was about this anticline. Everybody needs to understand. An anticline is a fold. It is a fold (demonstrating), a fold of rock draping down. That is an anticline. A syncline is the reverse.

If we look at this map on the western side and it goes from blue to green, you'll see that the contours tighten up significantly. Well, this is a reflection of a deep-seated Devonian and pre-Devonian

fault. This particular fault is well-known; it's been well-documented in a lot of literature. It goes approximately 21 miles in a north-south direction, and that -- the green part is downthrown, and the eastern part is upthrown. And that is what is setting up the sand pile in the 2nd Bone Spring Sand. It is not an anticline. The sand --

May I move on to map number two?

Q. That's the isopach, which is Exhibit 6?

A. That's the isopach.

I'll run through these pretty quickly. I can take questions at any time.

This is an isopach of crossover sands, not the thickness of the 2nd Bone Spring Sand. This is only neutron density crossing over at 10 percent to give us pore volume available for oil saturation. As we can see, that pile of sand is also lineated north and south, lining up against or structured north-south. So I contend that there is no anticline strictly in Section 18. It is a long, broad feature.

And as I was reviewing this Exhibit 14 from Chevron, in the seismic picture, we can see some faulting in the lower portion. And after that faulting has stopped, we can just simply see the draping of the sands going from -- or formations going from the east to

the west causing a drape feature. It is not a syncline -- an anticline. So, therefore, the stress of a folded syncline -- or anticline would not be the same as simply draping over a deep-seated structure.

Q. How many Bone Spring wells have you dealt with in this area of southeast New Mexico, Mr. Harris?

A. Of my own geology?

Q. Yes.

A. Approximately 25.

Q. And how many Endurance wells have you been involved in?

A. All of them. We have currently drilled seven in just this area, plus participated in three, of which I also did the geology on.

Q. I would like for you to highlight in red the fault that you see in Exhibit 14 of Chevron, and show that and highlight it on the Examiner's exhibit?

MR. PADILLA: May he, Mr. Examiner?

EXAMINER EZEANYIM: What?

MR. PADILLA: May he highlight Exhibit 14 on yours?

EXAMINER EZEANYIM: On this one? On yours?

MR. PADILLA: No. On Chevron's.

EXAMINER EZEANYIM: Yeah. I have it.

MR. FELDEWERT: Hold on a second. They

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want to write on our exhibit?

THE WITNESS: Well, faulting is -- I am not a seismologist.

MR. FELDEWERT: I will give you that.

I think I started to object to them writing on our exhibit.

MR. PADILLA: Fair enough.

Q. (BY MR. PADILLA) Can you point it out?

A. This general area right here (indicating).

EXAMINER EZEANYIM: Is what?

THE WITNESS: Would be the fault section. This is the layered section of the Bone Spring (indicating).

EXAMINER EZEANYIM: Counsel, let me ask a question, since we are here now, before I forget it.

What is your name, again, please? I forgot.

THE WITNESS: Randall.

EXAMINER EZEANYIM: Randall. Okay. I think this is Exhibit Number 5. I mean, I have to talk. Chevron said it's anticline. You say it's syncline, right? I mean in Section 18, right?

THE WITNESS: Yeah, Section 18.

EXAMINER EZEANYIM: You say it's a syncline.

THE WITNESS: No. I'm sorry. I just misspoke.

EXAMINER EZEANYIM: Well, what is it? Is it an anticline?

THE WITNESS: Neither one.

EXAMINER EZEANYIM: What is it?

THE WITNESS: It's simply a drape. It's just a roll-over of the sands and the shales over a drop in elevation due to a deep-seated fault.

EXAMINER EZEANYIM: So if somebody says it's an anticline in that Section 18, it's not true?

THE WITNESS: No, it's not true.

EXAMINER EZEANYIM: Even though I'm not a geologist, I can really -- but that's fine. I mean, we are just getting testimony.

Okay. Go ahead.

Q. (BY MR. PADILLA) So what ultimate conclusion do you reach with regard to -- based on your experience and knowledge of this area as to the folding effect and the natural fracturing that Mr. Schwartz testified about?

A. Well, let me start off with this is a very long feature, and several piles of sand, these sand ties, has laid up against the upthrown side of this fault block -- of this deep-seated fault, and that has set up some very, very good wells. Some of the best wells in the

Bone Spring is on this trend.

Q. And north and south?

A. North and south.

Q. And how are those wells oriented?

A. North and south.

Q. Does an east-west well make any sense to you geologically in Section 18?

A. No, it doesn't, just because of our experience. We have drilled Section 30, two wells, north-south, which happens to be on the exact same apex of the -- or the crest of this fold, and both of them have turned out extremely well.

Q. What kind of wells are they, when you say extremely well?

A. The latest IP on our Telecaster 4H was a little over 1,800 barrels a day, and the IP on the Telecaster 3H was 1,350.

Q. Let me ask you about this issue of conventional or unconventional. Does that have anything at all to do with drilling Bone Spring wells?

A. Not in the way that I explore. I look for conventional sands within the Bone Spring. I look for sand piles, identifiable. Yes, they are low perf, but sand is a sand is a sand, and it's conventional.

Q. Would approval of the north-south well proposed

by Endurance be in the best interest of conservation and the protection of correlative rights?

A. Yes.

MR. PADILLA: That's all I have.

EXAMINER EZEANYIM: Thanks.

Mr. Feldewert?

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Harris, did you develop Exhibit Number 5?

A. Yes, I did.

Q. Now, I'm trying to understand. You show -- on this exhibit, you show what appear to be represented as stand-up horizontal wells in this area?

A. Correct.

Q. Are you representing to the Division that all of these stand-up wells that you show on this map have been drilled?

A. No, they haven't. No, they have not been drilled. They are also locations.

Q. Have any of them been drilled?

A. Yes.

Q. How many?

A. Seven.

Q. Where are they located?

A. We have two of them in Section 30.

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Q. Hold on a sec. Section 30 is two miles to the south?

A. Yes.

Q. Okay.

A. Two in Section 29, which are on top of each other.

Q. Again, two miles to the south?

A. Well, actually, it would be just one mile when you take the toe to the heel. Now, from surface to surface, yes, it would be two miles, but it would only be one pile mile from the toe to the heel.

Q. In Section 29, you say you have two?

A. Yes, the Caza Copperlines.

Q. Those are drilled by Caza?

A. Yes, they were.

Q. Where is the other one?

A. There are three of them in Section 20.

Q. Have they been drilled?

A. Yes. And we're starting our fourth.

Q. That's seven?

A. Yes.

Q. And all the rest of them on here are just proposed wells? Is that what you're trying --

A. Proposed and approved locations, yes.

Q. Now, the same thing with respect to your

Exhibit Number 6. You're not representing that all of these wells on there have been drilled?

A. Correct.

Q. With respect to your Exhibit Number 5, if I look at -- I'd like you to take a look at -- I want you to keep that on, and I want you to take a look at Chevron Exhibit Number 13, please. Do you have that in front of you?

A. Yes, I do, sir.

Q. Did you prepare the map on the right-hand side?

A. One of my earlier works, yes.

Q. The Endurance map?

A. Yes.

Q. One of your earlier works?

A. Correct. As we drill, we continue to refine our maps.

Q. Okay. Have you drilled anything to the east of Section 18 to give you data points?

A. No.

Q. Have you drilled anything to the northwest of Section 18 to give you additional data points?

A. No.

Q. It would appear to me that you moved the top of your structure, shown on Chevron Exhibit 13, more to the center of Section 18 on your new Exhibit Number 5; is

that, correct?

A. Yes, slightly.

Q. So we have a couple of different interpretations going on here.

Are you suggesting that there are new data points that caused that structure to shift to the left?

A. No, just a refinement of the map.

Q. No additional data points?

A. No.

Q. Would you agree with me that your Exhibit Number 5 does show a structural high running through the middle of Section 18?

A. Yes.

Q. And extending a little bit into the center of Section 19?

A. Yes.

Q. And if you look at Chevron Exhibit Number 13, they show -- what they show is an anticline that basically follows that same structure; does it not?

A. Yes, it does.

Q. And then the structure drops off to the right and the left as you move out of 18?

A. Yes.

Q. And is it your testimony -- or did you say that there was well-documented literature that indicated that

that structure high in Section 18 is not an anticline?

A. I'm saying that the deep-seated fault is well documented.

Q. The deep-seated fault located where?

A. Beyond the eastern side of Section 18, Section 19, Section 30, Section 31, going to the north through Section 7.

Q. Is that your big red area on Exhibit Number 6?

A. No. The big red area on Exhibit Number 6 is porosity feet.

Q. I'm trying to figure out where you contend this well-documented structural fault is located?

A. Well, it's not on these maps. I'm not working with the Devonian. I'm working with the shallower zone.

Q. You're not working with the Devonian. So the fault deals with the Devonian?

A. Yes. It sets up the Bell Lake Bone Spring, the Antelope Ridge Bone Spring.

Q. But you don't know show that, what you call a well-documented fault, anywhere on this map?

A. No, because it's not -- it's not faulting through the Bone Spring. The faulting stopped in the Devonian.

Q. And you haven't brought any of that literature here with you today?

A. No.

Q. Did you present any of that literature to Chevron when you showed up in November?

A. No.

Q. Now, on Exhibit Number 6, that big red area there in Section 20 and into 19 -- do you see that?

A. Yes, I do.

Q. Are you contending that that is a big pile of sand, as you put it?

A. Yes, sir.

Q. I don't see a data point in Section 19 for that big pile of sand, do you? Or am I missing something?

A. Section 19 has two data points.

Q. And what are those data points? Where are they located on this particular map, this Exhibit Number 6?

A. It's not written down. I'm sorry.

Q. I don't see it.

MR. RITTER: I see them. They're on there.

Q. (BY MR. FELDEWERT) Do you see them, Mr. Harris? You're a geologist. You're looking at the data. Did you put this map together?

A. Yes, I did.

Q. Okay. Where is your data point in Section 19?

A. Well, there is -- I've got to get myself oriented here. Section 18, there is a 48 in the

north -- approximately 1,980 from the north and 1,980 from the west, 48 feet of pay. And right below that, it states 54 feet of pay.

Q. And what's the third data point in Section 18?

A. 54 feet of pay.

Q. Why does it have yellow rather than green if it's 54?

A. That is a contention of -- a function of a mapping program that did that.

Q. So you have two data points at 54 with two different colors?

A. Correct.

Q. Now, in answer to my question, going into Section 19, where is there a data point to support your big pile of sand in Section 19?

A. The data points would actually be down in Section 30.

Q. No data points in Section 19?

A. Not on this map.

Q. Now, I'm looking over at Section 20. On this map, which you created, where is the data point for the big pile of sand in Section 20?

A. It's marked at 143.

Q. And that comes off of what well?

A. Comes off the Stratocaster #1H, formerly known

as the Paloma Blanco 20 #1.

Q. Do you have a type log for that well anywhere in your exhibits?

A. No, I don't.

Q. So that's the only data point that you have in Section 20 --

A. No. There's --

Q. -- for that big pile of sand?

A. We also have number 24.

Q. Number 24 where?

A. Section -- sand count of 74, and that would be in the back basin, Unit Number 1, which is in the southeast quarter.

Q. The east half of the east half of Section 20?

A. Correct.

Q. 74, right?

A. Right.

Q. Okay. And if I move more north into 17, do I see any data points there?

A. Yes, you do. You see 110, and that would be the Paloma 17 #2, drilled by Devon.

Q. Paloma 17 #2?

A. Yes. That happens to be right where the label is.

Q. And that's 110 there according to your mapping?

A. I believe, yes.

Q. I want you to turn to Chevron Exhibit Number 19, please.

I'm sorry. Do you have a type log here of that particular well in Section 17?

A. No, I don't.

Q. Turn to Chevron Exhibit Number 19, please.

A. Okay.

Q. Do you see the type log on the right-hand side of that exhibit?

A. Yes.

Q. That's the same -- that's the type log for the Paloma Blanco 17; is it not?

A. I would assume.

Q. Same well you just talked about?

A. I'm assuming.

Q. You're assuming.

Let's flip one forward to Exhibit 18 -- Chevron Exhibit 18. Keep your finger on there, and move to Chevron Exhibit 18.

A. Okay.

Q. Do you see that cross section --

A. Yes.

Q. -- Paloma Blanco 17?

That's the same well as your 110 data

point; is it not?

A. Yes.

Q. Go over to the cross section, then, on Exhibit 19. Are you suggesting that that 110 data point is supported by that type log shown on the right-hand side of Exhibit 19?

A. The way they constructed the cross section, I couldn't tell.

Q. This is a type log; is it not?

A. It's a type log, but it's not --

Q. Show me on the type log the data that supports your 110 data point that you show on your map that's Exhibit Number 6. What would we look at?

A. You would look at the cross-over of neutron and density curves above 10 percent, which is not evident on these logs, on the cross section. It cannot be seen with my eyes. It's totally different than the contour interval and uniform thickness that they have presented. They are using a net sand above 8 percent density only. I'm using neutron density cross-over above 10 percent identifying what I would consider fairway sands.

Q. And you're saying that data supports 110 as a data point? Is that what you're saying?

A. If we're talking about the same well, yes.

Q. Do you have that data here today?

A. No.
Q. So the Division can't examine it?
A. No.
Q. Is your neutron affected by clays?
A. Yes, it is.
Q. Now, you're not a seismologist?
A. No, sir.
Q. You're not a geophysicist?
A. No, sir.
Q. Do you have any seismic data on Section 18?
A. No. I do have some of the deep Devonian.
Q. I'm talking about 2nd Bone Spring Sand.
A. No, sir.
Q. Would you agree with me that seismic data is better to determine structure and geologic conditions rather than the well data?
A. Structure, yes.
Q. What about geologic conditions?
A. Depends on the conditions you're speaking of. Porosity, no.
Q. Would you -- porosity, no. Is that what you just said?
A. I say no, in thinning vetted sands such as these.
Q. Would you agree that the seismic data is

helpful in determining whether there is an anticline?

A. Yes.

MR. FELDEWERT: That's all the questions I have.

EXAMINER EZEANYIM: Okay. Thank you very much.

Any redirect?

REDIRECT EXAMINATION

BY MR. PADILLA:

Q. Mr. Harris, looking at Exhibit 14 of the Chevron packet, does that show an anticline or a draping feature?

A. It shows a draping feature.

Q. Because of what?

A. You don't see two distinct arms draping of the anticline.

Q. Now, how much mapping have you done of the Bone Spring in southeast New Mexico?

A. I have covered just about the entire Basin, from Jal to Loco Hills, all the way south to Carlsbad.

Q. 2nd Bone Spring?

A. 1st, 2nd and 3rd.

Q. So when you say that this feature extends north and south through Section 18, is that included in your mapping, and is that sort of thing that comes into play

in terms of defining your pile of sand?

A. Yes, sir, it does.

MR. PADILLA: That's all.

EXAMINER EZEANYIM: Okay. Anything further?

MR. FELDEWERT: No, Mr. Examiner.

CROSS-EXAMINATION

BY EXAMINER EZEANYIM:

Q. Did you determine the fracture orientation in Section 18? Did you try to determine the fracture orientation?

A. I do not, no.

Q. But you didn't try to do that?

A. No, sir.

Q. So you would agree with me that the fracture orientation that was done, the microseismic, is north-south? Is that done correctly? Would you agree with that?

A. I would agree with that.

Q. Then it has nothing to do -- when you're talking about your fault in your Devonian, what has this got to do with the Bone Spring?

A. As the fault block lifted on the up-dip side and fell on the down-dip side, it left this mountain, so to speak, and as valley fields came in, each layer

continued to build up over the top of it. And finally, on the Bone Spring's side, it is still evident as a slope.

Q. Good. But you testified -- I mean, Section 19 is neither a syncline or a anticline. It's a mass of sand, right?

A. Right.

Q. I hope that sand is conventional. Do you think it's conventional sand?

A. Yes, I do.

EXAMINER EZEANYIM: I think I need to clear something up in the interest of time, because, again, we are going to talk to the engineer.

First of all, in this application, in case we start making -- what exactly does Endurance want? Do you want 120 acre, or you need 160?

MR. PADILLA: 320.

EXAMINER EZEANYIM: 320.

MR. PADILLA: Yes.

EXAMINER EZEANYIM: Okay. And you are going to drill the well in the east half-east half?

MR. PADILLA: That's correct.

EXAMINER EZEANYIM: You are going to develop the west half-east half?

MR. PADILLA: That'll follow after drilling

the east half-east half.

EXAMINER EZEANYIM: Oh, you just want to form the unit first?

MR. PADILLA: Yes.

EXAMINER EZEANYIM: I just wanted to make sure I understand that.

And, again, when you found that 320 from the compulsory pooling; is that right?

MR. PADILLA: And, obviously, if we're successful at the end of the day.

EXAMINER EZEANYIM: I understand. If 320 is formed, then you can compulsory pool it.

MR. PADILLA: Yes.

EXAMINER EZEANYIM: That's the statement I made in the morning about compulsory pooling in a vacuum, because with 320, there is nothing to pool. See what I mean?

MR. PADILLA: Right.

EXAMINER EZEANYIM: Okay. Good. I mean, I just want to clarify that.

Okay. Coming back to Mr. Harris.

Q. (BY EXAMINER EZEANYIM) So when we have a massive sand, in your geologic opinion, what is the best orientation for wells drilled in Section 18, because it appears to me no well has been drilled there, no well as

of now, except the one that was drilled by Chevron, stopped at 5,000. No well has been drilled in Section 18, right?

A. Correct. Nothing in Section 18.

Q. Okay. Now, what is the best orientation?

A. What I did is still going to be north-south.

Q. Why? Why?

A. Staying within the thickest part of the sand body.

Q. And which exhibit are you looking at of yours? Exhibit Number 6?

A. Yes, Number 6. The east half-east half location would drill through the thickest part of the isopach sands.

Q. Did we talk about porosity? Did you say you didn't know -- you don't know what it is in this area?

A. No. The porosity? This map is based on 10 percent porosity of neutron and density cross-over.

Q. And the average thickness in this area is what; do you know?

A. The average --

Q. Thickness.

A. Oh, these sands? Two- to six-foot thick.

Q. How much?

A. Two- to six-foot thick. That's what the cross

section on the bottom, highlighted in pink -- those are actual points of cross-over between the neutron density.

Q. You didn't try to construct what I call the net isopach map?

A. This is a net isopay map.

Q. Which one? Number 6?

A. Yes, Number 6.

Q. Okay. Oh, you called it a porosity map. Okay.

EXAMINER EZEANYIM: You may step down.

THE WITNESS: Okay.

EXAMINER EZEANYIM: Call your next witness.

MR. PADILLA: Mr. Examiner, we move the admission of Exhibits 5 and 6.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Exhibits 5 and 6 will be admitted.

(Endurance Resources, LLC Exhibit Numbers 5 and 6 were offered and admitted into evidence.)

EXAMINER EZEANYIM: Do you want to take a five-minute break before we -- let's take five minutes.

(Break taken, 3:15 p.m. to 3:24 p.m.)

EXAMINER EZEANYIM: Call your next witness.

MANNY SIRGO,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. PADILLA:

Q. Mr. Sirgo, state your name.

A. Manny Sirgo.

Q. Mr. Sirgo, where do you live?

A. Midland, Texas.

Q. And what do you do?

A. I'm a VP of Operations for Endurance Resources.

Q. Are you an engineer or --

A. I'm a petroleum engineer. I graduated from Texas Tech in 1978.

Q. And have you previously testified before the Oil Conservation Division?

A. I have.

Q. And as a petroleum engineer?

A. Correct.

Q. Do you do reservoir -- have you done reservoir studies -- are you primarily a reservoir engineer?

A. I started my career as a reservoir engineer for Exxon.

Q. Have you prepared an exhibit for introduction here today dealing with reservoir ultimate recovery studies and things of that nature?

A. Yes, I have.

MR. PADILLA: We offer Mr. Sirgo as an expert petroleum engineer.

EXAMINER EZEANYIM: He is so qualified.

Q. (BY MR. PADILLA) Mr. Sirgo, let me call your attention to Exhibit 8 and tell us what that contains.

A. Okay. Endurance is going to look at -- since the Examiner asked for an attempt to put EUR to the location we've drilled in this area and what we think the EUR might be for an east-west versus a north-south well.

The isopach we generated, the net pay isopach, based on the 10 percent cutoff that Mr. Harris talk to you about. There are four wells in this sand pile that have had some production history, enough production history to put an EUR based on decline curve analysis.

Q. Let me ask you before you continue, in drilling, what's your experience with 2nd Bone Spring wells?

A. Well, we have a very active drilling program right on this very pile of sand, and we've been at it since April of last year drilling in this particular location.

Q. How about in southeast New Mexico?

A. This is -- well, we have other areas that -- we have other areas that we're developing our own -- so, I mean, we're working pretty much the entire 2nd Bone Spring play in Lea County and Eddy County.

Q. How many wells have you been involved in more or less directly in this area and in other areas, 2nd Bone Spring?

A. Between the operator wells and nonoperated wells, probably 18.

Q. Is this the first time you've done an EUR for the 2nd Bone Spring?

A. We've developed an EUR for every Bone Spring well that was ever drilled. We've had that for over a year.

Q. So you have quite a bit of experience with that?

A. Correct.

Q. Let's go on back to Exhibit Number 8. What does that contain, again?

A. Okay. So if you go back to Mr. Harris' exhibit, Exhibit 6, which is our isopach map, you'll see we've got some red polygons drawn on that isopach map.

Q. When you say polygon, what do you mean by polygon?

A. We refer to those as the drainage area for that

horizontal well, 160-acre drainage area for that horizontal well. And the purpose of that polygon relative to this isopach is to calculate acre-feet of pay at this porosity payoff within that red box to use in our volumetric [sic]. So that's the significance of each of these red boxes.

The mapping software is PETRA. PETRA goes in, does a load analysis, comes up with an average footage of pay within each of those red boxes. And we're using a volumetric formula. And on the front of Exhibit 8, you'll see the formula we used to calculate original oil in place for each of the polygons. And anyone who does a lot of volumetrics knows that water saturation is a pretty important number because it occupies a big part of your pore space, or can.

Exhibit 8-2 is core analysis that came out of the Copperline well, which is the well located in Section 29. It's the 2nd Bone Spring horizontal. Caza drilled it. Both Endurance and Chevron participated in that well. And so we had four sidewall cores out of the 2nd Bone Spring area. And the whole point of that exhibit is just to show where I got the water saturation I used to plug into the oil-in-place calculation, which is 48.44 [sic]. Simple average. I used a nomograph to come up with the BCI [sic], about a 1425 average EUR.

The average feet of pay is calculated by PETRA through load [sic] analysis, put it all in the oil-in-place calculation, and that gets us to an oil-in-place calculation for each of those polygons.

The first two in red are the proposed east-west, north-south polygons; north-south, Endurance; north-south, Chevron. And then the last four are the active 2nd Bone Spring horizontal wells that we have production data on.

Q. What conclusion do you have in terms of ultimate recovery from your proposed well and Chevron's proposed well?

A. Attached as Exhibits 8-3, 8-4, 8-5 and 8-6, those are the decline curves for the four active 2nd Bone Spring horizontals that are in the red polygons. There are three Endurance wells: Stratocaster 1H, 4H, Caza Copperline 1H, and the Endurance Telecaster 3H. I've put the cline curve parameters we use. We have a B factor of 1.4; initial cline, 99.1; and a minimum cline of 6 percent. So that gave us EUR that you see in black for each of those polygons. We looked at the average recovery versus the oil in place. Took the four wells, came up with an average recovery for four polygons, 13.71 percent of original oil in place.

We then took the oil-in-place numbers we

calculated for the proposed Endurance north-south well and the proposed east-west Chevron well, applied the 13.71 percent recovery factor to that oil in place. The Endurance well yielded an EUR of 3365,000 barrels. The Chevron Bell Lake well yielded an EUR of 289,000 barrels of oil.

So the point of the exercise was to try and apply a volumetric approach to estimate what the recovery should be either from a north-south or east-west.

Q. And what result did you -- do your calculations make?

A. Well, the north-south Endurance well, like I said, is going to have an EUR of 365,000 barrels versus 281,000 or 282,000 barrels for each Chevron well. So that's 83,000 more barrels recovered by the Endurance north-south well versus the Chevron east-west proposed well.

Q. Why did you choose four wells that you chose?

A. Well, because they're active producers in the 2nd Bone Spring.

And as far as drilling activity on this particular pile of sand we have mapped, in Section 30, which is where one of the red polygons are, that's the Telecaster 3H -- the 4H well has now since been

completed. The Stratocaster 2H, which is the east offset to the 1H, has been drilled, has not been completed. And then the Caza would be in the 1H location, is currently drilled in the 2nd Bone Spring. The one well on the east side, it's in there because it's on the map. It's an east-west well. It's a 3rd Bone Spring well that Mewbourne drilled, and it's a poor well.

I've also -- if you're interested, I have the daily production volumes for those four wells. They have more -- they have a lot of history at this point, several months. But Chevron, I know, looked at IPs. Just to give you a flavor for the quality of these wells: The Stratocaster 1H, 58 days of production; cum oil, 41,000 barrels; the Telecaster 30-3H, 52 days of production; cum oil 35,272 --

EXAMINER EZEANYIM: Where are you looking?

THE WITNESS: I've got these. If you want this data, I can make it available to you. Do you have the decline curves?

EXAMINER EZEANYIM: Is there a completion?

THE WITNESS: No. We've shared some of this data with Chevron before.

EXAMINER EZEANYIM: But is it a part of your exhibits?

THE WITNESS: It's not in there. You have the decline curves and the monthly production as reported to the OCD. Those are in the exhibits.

EXAMINER EZEANYIM: What do you have there?

THE WITNESS: This is the actual initial 30 to 50 days of production for each of these new wells, so you can see what kind of wells we're talking about here.

EXAMINER EZEANYIM: I would like to see that, if you don't mind, Mr. Feldewert. I would like to see the IPs that you have. Do you have any objection?

MR. FELDEWERT: Mr. Examiner, if you want to see that, that's fine. I would ask that we get copies.

EXAMINER EZEANYIM: Oh, yeah, if you have it.

THE WITNESS: Those are the daily production vibes [sic] for when the well was brand-new.

EXAMINER EZEANYIM: Which well is this? Which well are you talking about? Most of the wells.

THE WITNESS: So there are four polygons we calculated the oil in place for. These are the four wells.

EXAMINER EZEANYIM: Oh, okay.

THE WITNESS: Okay? So let's just pick one: The Stratocaster 1H. So that well cumed 41,000

barrels of oil in the first 58 days. If you go to your isopach map --

EXAMINER EZEANYIM: I had to see where you're -- which one -- where is it? I need to see it.

THE WITNESS: Stratocaster 20-1H (indicating). So it's Section 20. That's this well right here (indicating) that we did volumetrics on. That's that well (indicating).

EXAMINER EZEANYIM: Okay.

A. Now, the other obvious big issue here is the discussion about what is the geologic event here. Obviously, we don't think there is anything unique about Section 18. Geologically, it's set up by default. It's been known forever. We did do a geomechanical study, and we have the analysis from the actual frack results from these wells on this pile of sand to help indicate which stress orientation is going on here.

EXAMINER EZEANYIM: This well is a north-south well, right?

THE WITNESS: They're all north-south wells.

EXAMINER EZEANYIM: Let's get this straightened out. Go back to 8-1. I know the ones that are proposed in red. The rest are in black. Those wells are already producing, right, in Sections 20,

29?

THE WITNESS: Okay. So there is the Telecaster 3H well, which is in Section 30. It's got a red square around it. That's one of the wells on Exhibit 8-1 that we did a volumetric on. That's the table in the right hand.

EXAMINER EZEANYIM: Let's go here (indicating).

THE WITNESS: Right. So the first two wells on that list are in red. Okay? That's the two proposed wells, Endurance versus Chevron. The third well is the Stratocaster 1H. That's this red polygon --

EXAMINER EZEANYIM: Yeah, I see it.

THE WITNESS: -- in Section 20. 4H is the other red polygon in Section 20. The Caza Copperline is the red polygon down here in Section 29, and the Telecaster 3H is the red polygon in Section 30.

EXAMINER EZEANYIM: And all those are north-south?

THE WITNESS: Correct.

EXAMINER EZEANYIM: The only one that is east-west is the Chevron Bell Lake?

THE WITNESS: The proposed well.

EXAMINER EZEANYIM: Yeah.

THE WITNESS: At the time they permitted

that well, there were nine approved north-south permits on this pile of sand already existing.

And like I said, we have two other engineers here. We did do a geomechanical study on the stress orientation, and we also have a history match on actual frack data to further support the orientation. We have two other engineers here to testify about it.

EXAMINER EZEANYIM: Go ahead.

Q. (BY MR. PADILLA) I lost track, Mr. Sirgo.

EXAMINER EZEANYIM: I'm sorry. I'm sorry I interrupted.

Q. (BY MR. PADILLA) I lost track of where we were. Did you get through 8-6?

A. Well, like I said, the decline curves, the actual reported monthly production is in there. That's where the new [sic] oil column came from.

Since there's been so much talk about our previous EUR study -- the only thing we did was go out and find every Bone Spring well we could find in the area. We didn't -- we didn't rate them versus being on 3 months, 6 months, 12 months. We were just looking for all the wellbores in the area.

And probably -- you know, if you've been to any industry talks on the Bone Spring, there's always a slide, and there's a presentation about east-west versus

north-south, and everybody accumulates all this production data. And we keep seeing the same exhibits, where one orientation dominates the other orientation. That's about the extent of the effort we put in to identifying what we did there.

And the point of Exhibit 9 is just that Caza, who releases a lot of public information, did the same thing in basically the same study area, the 3rd Bone Spring, and came up with the same conclusion, that east-west wells did poorer than north-south wells. And maybe the only thing relative about that is we've got an east-west 3rd Bone well on our east news [sic] line, east of the sand pile, that's a fairly poor well by our standards.

Q. You're pointing to an exhibit that shows that well. Can you -- what exhibit were you --

A. So on Exhibit 6, Randall's isopach map, the east-west well in Section 21 is actually a 3rd Bone Spring well that Mewbourne drilled. And the only point being that public data for the same area that Caza put out there said that east-west wells were poorer than north-south wells in the 3rd Bone Spring.

Q. Do you find any difference in the stress orientation in the 1st, 2nd or 3rd Bone Spring?

A. No, not in this area. And I think we can get

our engineers on here to talk about work we've done for geomechanical modeling. I think that will help everybody.

Q. And they're going to talk about the 2nd Bone Spring?

A. Correct.

EXAMINER EZEANYIM: Who is going to talk about it? Who?

MR. RITTER: I will.

EXAMINER EZEANYIM: I thought he is an engineer.

THE WITNESS: He is. We have three engineers here.

MR. RITTER: Two and a chemist.

EXAMINER EZEANYIM: Good.

MR. PADILLA: Pass the witness.

EXAMINER EZEANYIM: Mr. Feldewert?

MR. PADILLA: Before that, let me move the introduction of exhibits -- all of Exhibit 8 and Exhibit 9.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No.

EXAMINER EZEANYIM: Okay. 8 and 9 will be admitted.

(Endurance Resources, LLC Exhibit Numbers 8

and 9 were offered and admitted into evidence.)

EXAMINER EZEANYIM: Then what do we do with this information? Mr. Feldewert, if you don't mind, we can copy these two pieces of paper.

MR. FELDEWERT: Yes, we have copies.

EXAMINER EZEANYIM: You have a copy?

MR. PADILLA: We can mark that as Exhibit 15.

EXAMINER EZEANYIM: No objection to that?

MR. FELDEWERT: No.

MR. PADILLA: Move the introduction of that.

EXAMINER EZEANYIM: Exhibit 15 will be admitted. And this is Endurance.

(Endurance Resources, LLC Exhibit Number 15 was offered and admitted into evidence.)

MR. PADILLA: Before we move on, I have another exhibit I'd like to introduce through Mr. Sirgo.

Q. (BY MR. PADILLA) Mr. Sirgo, I admitted Exhibit Number 7. Will you identify that for the Examiner, please? What is that?

A. Exhibit 7 is a map of approximately eight townships in Lea County, New Mexico. It identifies Endurance's acreage position in green. It identifies

the north half of Section 18, with the section that's being discussed here today. It's identified in red. And the wells in red -- or the wells that have red circles on them are Chevron permitted or drilled wells.

Q. Are any of those wells of Chevron that you show oriented east-west?

A. Only the proposed Bell Lake well that we're talking about today.

Q. Did you prepare this exhibit or have it prepared under your supervision?

A. People under my supervision.

MR. PADILLA: We'd move the admission of Exhibit 7.

EXAMINER EZEANYIM: Exhibit 7 will be admitted.

(Endurance Resources, LLC Exhibit Number 7 was offered and admitted into evidence.)

MR. PADILLA: Pass the witness.

EXAMINER EZEANYIM: Mr. Feldewert?

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Sirgo, I'm looking at Exhibit Number 8. That's your volumetric study?

A. Correct.

Q. If I'm understanding the four wells, there are

two in Section 20, one in Section 29, one in Section 30?

A. That's the four active wells included in the study.

Q. If I go to example page 83 -- 8-3, does that relate to one of those --

A. Correct. So that's the Stratocaster 20-1H.

Q. And how long is that well on production that you utilized?

A. That looks like it came on in September. We've got the actual first start date. No, it's not on there. Where did I have it?

Q. Looks like almost two months.

A. Well, we have through January data, so --

Q. I'm talking about on this particular map.

A. On that curve, it's -- so that looks like it has January 2014 on it, and that well --

Q. So looking at Exhibit 8-3, what does it indicate, in terms of a time frame, that you're utilizing in your analysis for the production period?

A. September, October, November, December and January.

Q. So is that reflected on here?

A. Well, this curve is a monthly curve.

Q. And it looks like they stopped, roughly, in January; did it not?

A. Correct.

Q. So that's a few months. What about the next one, 8-4? I'm just looking at your exhibit.

A. Correct.

Q. How many months are reflected on there for production?

A. So that's the Stratocaster 20-4. That would be October, November, December, January.

Q. Three or four months?

A. Four months.

Q. Again, moving to 8-5, how long has that well been on production?

A. That's the Telecaster 3H. That's a brand-new well. So some of December and January.

Q. And then --

A. Copperline.

Q. Six, yes?

A. November, December and January.

Q. And so none of your wells produced -- that you utilized produced any longer than four months, at most?

A. Correct.

Q. With respect to -- I want you to lay out Exhibit Number 5 in front of you and then Exhibit Number 6, please.

A. Okay.

Q. And then I want you to go to our notebook and lay out Exhibit Number 13.

A. 15?

Q. 13.

A. Oh, sorry. Okay.

Q. So we have laid out in front of us Endurance Exhibit Number 5, Endurance Exhibit Number 6?

MR. FELDEWERT: And then, Mr. Examiner, I laid out Chevron Exhibit Number 13.

Q. (BY MR. FELDEWERT) Now, with respect to your first well, the Stratocaster #1H, that is in Section 20?

A. 20. Correct.

Q. If I'm looking at Chevron's Exhibit Number 13, that's off that structural high and into Section 20, right?

A. It's in the west half of the west half of 20.

Q. It comes off the structural high there?

A. Well, I assume this entire thing is a structure that you're showing (indicating).

Q. If I look at your Exhibit Number 5, it comes off that structural high you show in Exhibit 8 into Section 20. That's where your well is?

A. Our well is right there in the west half-west half.

Q. It's off the structural -- off the structural

high? It's not off towards the crest, right?

A. I guess that's correct.

Q. And you have a second well in Section 20?

A. East half of the east half of Section 20.

Q. East half of the east half. So it's way on the east half of Section 20, and that's way off the structural crest, right?

A. It's down dip.

Q. It's not on the crest. It's on the -- as you fall off the crest?

A. Correct.

Q. And if I go down to Section 29, it's the same thing; is it not? It's not on the structural crest. It's as you fall off the crest?

A. Correct.

Q. And then Section 30 -- where is your well in Section --

A. West half of the east half? It's on the -- it's on the crest with the same structural feature. It runs all the way through there.

Q. And that's what you show there?

A. Correct.

Q. And if I look over at Chevron Exhibit Number 13, it's based on seismic. They don't show the structure going down into Section 30, do they?

A. Well, you know, there are two really strong data points. There is a toe-and-heel well there in the logs. So those structural points in Section 30 are off log data, not off --

Q. Now, if I then look at your Exhibit Number 6, this sand pile that you talk about these wells being completed in --

A. Correct.

Q. -- that sand pile exists in Section 20, right?

A. Correct.

Q. And then down into 30?

A. Correct.

Q. And that's been the focus of your development?

A. Correct.

Q. Now, that sand pile that you show here doesn't exist up in the north half of Section 18, does it?

A. No. We have two data points there with the sand that's standing up.

Q. In fact, it shows up there -- the data points we have in Section 18 show a sand of 54, 54 and 48?

A. Right.

Q. Those are the only data points, right?

A. Well, you have one just northeast of it that's 35.

Q. So a different sand -- we don't have a sand

pile there that you keep talking about?

A. Well, the sand pile is diminishing to the northwest, and it's diminishing to the north. And that's based off of log data.

Q. The wells that you utilized are not -- that are in what you call the sand pile don't exist up in Section 18?

A. Oh, part of it exists in 18. Our isopach indicates that. That's why we chose the location we chose.

Q. And that isopach you're talking about --

A. Exhibit 6.

Q. If I'm looking at Exhibit 6, I show a data point of 54?

A. Correct.

Q. And you show a different sand depth there than you show -- the identical data point of 54 in the middle of Section --

A. That's our PETRA map. So if we pull it in too tight, it would have shrunk -- it would have shrunk the acreage going north and west even more so.

Q. Something's not right there; don't you think? You're showing the same number with different depths?

A. Well, it would be negative to your position.

Q. You're showing the same number with different

depths?

A. It's not different depth. It's a different thickness.

Q. But you don't have the concentration of sand that you have -- in your wells that you've just completed, correct?

A. Well, you can see from our isopach; the sand thins a little bit as it goes northwest.

Q. Let's talk about that. You want to orient your well north-south, correct?

A. Correct.

Q. You want to include federal acreage in the south half of Section 18 and federal acreage in the north half of Section 18?

A. State fee acreage.

Q. With fee acreage in the north half.

A. Right.

Q. And based on your map, you're showing a greater amount of sand in the federal acreage than you show in the fee acreage, right?

A. That's correct.

Q. You don't think the BLM's going to have an issue with you mixing the more productive sands, as you show it in the south half of 18, with less productive sands in the north half of 18?

A. I don't think so.

Q. Are you going to be able to testify, Mr. Sirgo, that a north-south well is going to contribute equally -- that all 40-acre tracts are going to contribute equally to the wellbore based on how you've mapped it?

A. Well, I think --

Q. You can't say that, can you?

A. No, you can't say that. You've got a hundred isopach.

Q. So the isopach says based on how you map it, if they create a stand-up well in the east half-east half of Section 18, the south half of that acreage is going to contribute more than the north half of that acreage, correct?

A. Well, you would have to say that based on the sand.

MR. FELDEWERT: Pass the witness.

EXAMINER EZEANYIM: Any questions?

MR. PADILLA: No.

CROSS-EXAMINATION

BY EXAMINER EZEANYIM:

Q. Mr. Sirgo, let's go to Exhibit 8-1. So what are you trying to achieve there in Sections 23, 29 and 30 --

A. Correct.

Q. They are the northeast wells. Anyway, they are producing. These black ones are producing now for about four to six months, right?

A. Right.

Q. Now, let's go to the red ones that have been a point of contention here. When you orient your well east-west, your original oil in place, it's less than when you go north-south?

A. Based on our isopach. You have less the net feet of pay in that polygon.

Q. And that was -- okay.

A. It's a box, yes.

Q. And because the original oil in place is more, you cover more --

A. I get more net feet of pay in the north-south well than I get in the east-west well.

Q. Even though it doesn't have the same factor. If we go -- what you are trying to insinuate is if you go north-south, you hit more oil?

A. Correct, regardless of stress orientation.

Q. Now, the other one is in Sections 20, 29, 30. They are all north-south?

A. Correct.

Q. Okay. Now, how did you calculate your initial

water situation?

A. I took it off the core data on the second exhibit. We have --

Q. So that's really the -- you didn't calculate it by equation?

A. I have five sidewall cores. Just averaged the five cores.

Q. And then on your 8-2, what is the yellow? Is that yellow?

A. That's the five 2nd Bone Spring sidewall cores.

Q. What? What?

A. The area that's highlighted? Okay. So it's -- they have core numbers on the left, 14, 15, 16, 17, 18, and then they have the depth that the core was taken. Okay? So those five cores are all 2nd Bone Spring sidewall cores.

Q. And we are talking about 2nd Bone Spring, all these wells?

A. All this is 2nd Bone Spring.

Q. And this is how you calculate your decline curve?

A. That's where we got the EUR after we calculated the oil in place for each of those wells.

Q. Okay. Very good.

Let's go to Exhibit Number 9. You

calculated it. How did you get those numbers for east-west and north-south?

A. Exhibit Number 9? This is public data that was released by this company, Caza.

Q. By who?

A. Caza Petroleum.

Q. Okay. They released -- which pool are these wells coming from?

A. Oh, it's a big study area similar to all these EUR study areas we've been talking about, except that they were focused on the 3rd Bone, not the 2nd Bone.

Q. So this is their study?

A. Yeah. The whole point of this was we've got people looking at the 3rd Bone in the same area we're looking at for stress orientation in the 2nd Bone, and they're seeing the same relationship between north-south and east-west. And the only significant point to that is on our immediate acreage area, we have an east-west well right on our east leaseline, right here (indicating), that Mewbourne drilled in the 3rd Bone and it's a poor well. So my point being, the stress orientation thing is not unique to Section 18, and it's not unique to the 2nd Bone Spring.

Q. So Mewbourne didn't indicate what sections or what townships?

A. Right. Right.

Q. They just said 3rd Bone Spring?

A. They talked 3rd Bone Spring, and this -- you know, this map that they did that's colored here is -- you know, they've got these bubble maps.

Q. Point being?

A. The whole point is it's just public data that was released that someone compared north-south, east-west in the 3rd Bone, in the same general area of Lea County that we're in.

EXAMINER EZEANYIM: Maybe somebody is going to talk about 10-1.

MR. PADILLA: Yes.

EXAMINER EZEANYIM: Okay. Let me see if I have any more questions.

Okay. You may step down.

Call your next witness.

MR. PADILLA: Mr. Examiner, we call Lyle Lehman.

LYLE LEHMAN,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. PADILLA:

Q. Mr. Lehman, have you testified before the Oil Conservation Commission?

A. This is my first time.

Q. Have you testified before the Texas Railroad Commission as an engineer?

A. Yes, several times.

Q. And have you been qualified as an expert in court cases?

A. Yes, I have been.

Q. In federal court?

A. Not federal court.

Q. State courts?

A. State court.

Q. Where?

A. Texas.

Q. How about any other states?

A. Wyoming.

Q. Wyoming.

And in what kind of cases were you qualified as an expert?

A. Typically they've been in stimulation cases where there has been some kind of incompatibilities or some kind of -- fracking over into other acreage, things

like that. There is a name -- legal term for that, but I don't know what it is.

Q. Tell us what you do for a living.

A. Okay. I'm the managing principal consultant for StrataGen, which is a wholly owned subsidiary for CARBO Ceramics.

Q. What do you do?

A. I'm a stimulation expert.

Q. And do you do work related to stress orientation and things of that nature?

A. I don't do so much stress orientation as much as I do stress environment in frack -- in the well. I help optimize profit placement in unconventional and conventional wells.

Q. Have you made a study for Endurance with regard to preparation for this hearing?

A. Yes, I did, and I don't have it.

Q. It should be up there.

MR. PADILLA: If I may approach the witness?

THE WITNESS: Am I missing it? Oh, yeah, here it is. Sorry about that.

MR. PADILLA: We're taking this out of order, Mr. Examiner.

Q. (BY MR. PADILLA) Tell us what Exhibit 12 is.

A. This is --

EXAMINER EZEANYIM: Excuse me. You work for Endurance?

THE WITNESS: No. I'm a consultant.

MR. PADILLA: Let me finish his qualifications. I'm sorry.

EXAMINER EZEANYIM: Yeah, that's what I want.

A. I have a bachelor of science in chemistry from the University of Oklahoma. It's not in Texas; it's not A & M. And I have worked for several major service companies. I'm considered an expert in data analysis of stimulation, and I've got 37-and-a-half years in the industry. I have about two dozen STU [sic] papers; I have seven patents, all in the area of stimulation. I've done a lot of expert-witness work. And I don't know. What else do you want to know?

MR. PADILLA: Can we tender Mr. Lehman as an expert?

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: Expert in what?

MR. PADILLA: In petroleum engineering.

THE WITNESS: Or stimulation.

EXAMINER EZEANYIM: Stimulation.

MR. FELDEWERT: I'm trying to figure out --

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he has a degree in chemistry.

THE WITNESS: Right.

MR. FELDEWERT: Okay. And you're trying to be qualified as an expert in petroleum --

THE WITNESS: Yeah. I'm a trained engineer. I don't have a degree in engineering.

MR. PADILLA: He's an expert in fracture stimulation.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: As an expert in fracture stimulation?

VOIR DIRE EXAMINATION

BY MR. FELDEWERT:

Q. You said you have a degree in chemistry?

A. Uh-huh.

Q. You said you don't do stress orientation?

A. No. That's not my -- normally it's stimulation. That's geomechanics issues.

Q. All right. So you're just -- you're just here to talk about fracture-stimulation issues?

A. Yes, sir.

Q. And what's your -- do you have -- do you have any degrees that bear on that?

A. I have years of training and experience that bear on that, extensive frack-modeling work.

Q. With whom?

A. Frack-modeling work? With StrataGen, Pinnacle Technologies, my own firm, and Halliburton.

Q. Do you have a CV here today at all?

A. No, but I can get you one.

MR. FELDEWERT: Mr. Examiner, I really don't have enough on his background to be able to examine him. He doesn't have a degree --

EXAMINER EZEANYIM: What are you saying?

MR. FELDEWERT: I don't see where he's qualified to be an expert fracture stimulation. I don't see where they have come forth with any evidence to indicate he has any expertise in this area.

EXAMINER EZEANYIM: Okay. Do you object to him testifying to fracture stimulation?

MR. FELDEWERT: Yes, until he's able to show us how he has expertise in that.

EXAMINER EZEANYIM: Okay. This is -- this is not, you know, a good meeting [sic], and I think I need to get all the information. I may have to give some time due process, let us hear him and see what he's going to say.

MR. FELDEWERT: It's your decision. I understand.

EXAMINER EZEANYIM: Let's hear him today.

This is not relying on him -- I'm not relying on him to say something. You may choose not to cross-examine him because you can't, but I think I will allow him to testify.

MR. FELDEWERT: I understand.

EXAMINER EZEANYIM: Would you say your name?

THE WITNESS: Lyle Lehman.

EXAMINER EZEANYIM: Okay. You will be able to testify to fracture stimulation.

CONTINUED DIRECT EXAMINATION

BY MR. PADILLA:

Q. Mr. Lehman, what is Exhibit 12?

A. It is a short presentation on some academic and then a pressure match and production history, March data showing the difference between stimulating into the maximum -- or drilling a well into the minimum stress direction and stimulating the maximum stress direction versus drilling a well into a maximum stress direction and having a longitudinal fracture.

Q. How does that relate to the dispute in this case, drilling east-west versus north-south?

A. Well, as I understand it, the maximum stress direction in the area of the sand pile, as it's poetically called, is in an east-west orientation. And

the wells are drilled to the north, much like they are in the Grant Wash and the Texas Panhandle, and much like they are in other formations in the Bach and other areas where I have some experience. And it's quite common to fracture -- to design wells that way and to stimulate in that way more than to try to take advantage of exposing the formation, because the impact of completing these is a combination of contact and conductivity.

Q. In a formation like the Bone Spring?

A. Like the Bone Spring or, you know, similar to like the Eagle Ford, like the Bakken, the Barnett, any of these that are below a -- below a millidarcy.

Q. Let's go to the second page of Exhibit 12. What do you show in that?

A. This is an academic relationship that was established in the Society of Petroleum Engineering Paper 133985. The principal author is Bob Shelley. The second author is Mohamad Salman, who is currently the head of the Petroleum Engineering Department at Texas Tech.

Q. Who is Mr. Shelley?

A. Pardon?

Q. Who is Mr. Shelley?

A. Mr. Shelley? He's an associate of mine at StrataGen. He's a professional engineer.

And anyway, it shows the relationship between how the impact of permeability has on the percentage of recovery over ten years versus well type. And it starts off with the 5 millidarcy case, with a vertical well, where you just mainly perforate it. And you may ask -- BillMatrix [phonetic; sic] asks the stimulation, and then if you did a frack job, how much more improvement production you would have. And then if you just laid a horizontal in it unstimulated, that would give the most impact, because as you go beyond that, if you fracked it under 5 millidarcy -- because you really don't improve the well in a 5 millidarcy case.

Q. Let's be sure we understand that. The light blue columns are what?

A. The medium blue in the back?

Q. Right.

A. Yeah. They're the 5 millidarcy case. So you've got a vertical well with a, quote, "natural completion," a vertical well that's fracked, a horizontal well that's not stimulated, a horizontal well that would be -- like in our case, it would be an east-west well. That's just like, basically, an open hole, and then a horizontal with -- turned around north-south, in our case, with five transverse fracks

and then horizontal with 11 transverse fracks. In other words, these are all built on a 40-acre spacing, and it would be that you go from 5 to 11, so a little bit more than double the frequency of your stimulation.

Q. And the red is?

A. The red is you've moved it one order of magnitude lower on permeability to half a millidarcy. And you see that the well performance starts to require that you need more and more stimulation, and you work towards having a horizontal well.

The third one is .05 millidarcy rock, and it shows that the only way that you have a performing well is that you have 11 transverse fracks in a horizontal.

And then the 5 microdarcy case, the light blue, shows the same thing.

And one way of looking at it is the 5 microdarcy case still has -- with 11 transverse fracks, outperforms five hundredths of a millidarcy, five transverse fracks. And, of course, the red arrow at the bottom shows as you go into these more unconventional type of reservoirs, you do increase your well costs.

Q. This is theoretical on this one?

A. Yeah, this is theoretical.

Q. Let's go on to the next page.

A. So the next page is -- we took the 40 days of production from the Telecaster 30 Fed 3H, which is a very short time. I mean, I think everybody in this room has heard enough to know that 40 days of time is what we had available to us, and we -- the history matched the performance as closely as we could, and this is a table of some of the results, which we have a 3,000-foot lateral. We were assuming it would run 40 acres. The reservoir pressure is 4,610, which is a normal pressure gradient. The bottom-hole pressure minimum to drawdown is 300 psi. That would be at abandonment.

The effective permeability was high in this case because we've got early data. So in order to get a match, we had to run our permeability up. Porosity at 12 percent, water saturation at 40 percent, which is what Manny's core analysis showed.

The fracture half-lengths are 170 feet. That's part of the match from the reservoir model. When we put -- what I've done for Caza and for Endurance is I have pressure-matched the frack treatments on about five wells in the 2nd and 3rd Bone. And we have a pretty good mechanical earth model that we're using now, and it's showing a fracture length. But we're also getting back to actual useful length, which in this case is 170 feet per wing of the fracture. Okay?

So in other words, we probably have proppant out in the 400-foot range, but only 170 feet of it is productive. We're contributing according to the 40 days of data.

We're showing that we have a propped fracked height of 105 feet, and then we have a fracture conductivity of 40.2 millidarcy feet. This is higher than a lot of the other operators, I understand, because both Caza and Endurance use ceramic proppant, which yields a lot higher conductivity. And then, of course, there would be 12 fracture stages, but there are 3 clusters per stage, so there are 36 fracks going on in the zone.

Q. You talked about conductivity. What do you mean by that?

A. That's the ability to flow fluids. It's akin to permeability. It's the ability to flow fluids -- or reservoir fluids through the proppant. And it's the induced fracture.

In their case, when they're talking about natural fractures, they're hoping -- they're hoping that their natural fractures will have either -- you can call it a natural completion like permeability, but if they -- if they dilate them, which, in theory, can cause shear dilation, it would be conductivity.

Q. Did you do a study in this same area for Caza?
A. Yes.
Q. When?
A. I've done two for them, and I've also evolved frack designs for them, which we are going to do on the next well.
Q. For Caza?
A. For Caza.
Q. And you're also consulting with Endurance on frack stimulation?
A. Yes. They initiated -- they actually got an initial design from Halliburton, and I tweaked it and approved it based what we have learned through my time and expertise in other fields, looking at this permeability range and the reservoir pressure range.

And then at the bottom of this page, what we're showing is -- again, what I said earlier is the name of the game in these types of reservoirs is contact and conductivity. And in terms of contact, if you had a north-south well, with 36 fractures, with 170 foot of effective propped length per wing, times two wings, with 105 feet of effective proppant height, you've got 1.285 million square feet of contact in the reservoir.

If you rotated that well to east-west, assuming you can prop the entire net, which is very

optimized -- and I've done a lot of frack jobs in that type of scenario. And it's very difficult to do, because the fracks tend to run into each other as you stage back toward the hill, and you get a lot of rotation and a lot of really bad geometry going on. The best you could get, if you propped the 3,000-foot lateral with all 160 foot of net pay, would be 480,000 square feet of contact.

Q. What does that mean in terms of oil recovery?

A. That means -- remember, the combination is contact and conductivity. What we did is we zeroed out conductivity. We're saying we have the same conductivity in both fracture scenarios. This says that you probably have a -- they're different in ratio in production of about a ten-year period. You would produce that much more oil out of the north-south -- north-south wellbore, east-west fracture.

Q. What you're saying is that an east-west well just simply won't recover as much oil as the north-south?

A. It's not possible.

Q. What's on the next page?

A. Next the page is the match. In the course, again, it's 40 days for production and -- well, 37, 40 days. And the important part is that the lines are

pretty much parallel, and they meet at the end point. And then as we have more data, these matches get better. And, unfortunately, the reservoir results tend to decrease a little bit.

Then the last page is forecasting the production over a ten-year period for the two scenarios. The blue is a north-south well trajectory, with 36 fracks, using the matched -- the current data, state-of-the-day, as we have now, 37, 40 days of data, what we would forecast the production to be. The red is an optimized case with an east-west trajectory. And as you can see, it's showing about -- quite a bit more production from the north-south wellbore direction.

Q. It's almost twice as much?

A. Almost twice as much.

Q. Or a little bit more than twice as much?

A. Yeah, a little bit more when you've got --

Q. And for the record, where are these numbers shown on this last page?

A. What do you mean?

Q. Where exactly on this last page are you referring to --

A. You mean how to read the graph?

Q. No, no, no. The table.

A. Oh, the table. So I had my reservoir engineer

put them on there, so we could read them, instead of interpreting them off of the chart.

Q. You mentioned that you have patents. Do you have patents with regard to fracture stimulation?

A. Yes. All seven of my patents are for fracture stimulation.

Q. Is there any scenario -- you've been here all day long, right?

A. Uh-huh.

Q. And have you listened to the Chevron witnesses?

A. Yes.

Q. Is there any scenario under which you would agree that, with respect to Section 18, you would advise drilling such a well east-west?

A. The only way that I would do that is if I knew for sure that the maximum stress direction was north and south.

Q. Is there any information out there that you have otherwise that would tell you that the stress direction is north-south?

A. Not that I'm aware of. And I've looked at the world stress map output, and I've also looked at other -- at the other exhibits that you have coming up, and I haven't seen anything.

Q. So on the Endurance wells that are north-south,

is it your opinion that they're oriented correctly?

A. Yes.

MR. PADILLA: I'll pass the witness and move the introduction of Exhibit 12.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Okay. Exhibit 12 will be admitted.

(Endurance Resources, LLC Exhibit Number 12 was offered and admitted into evidence.)

EXAMINER EZEANYIM: Before you say anything, Mr. Feldewert, let me ask a question.

CROSS-EXAMINATION

BY EXAMINER EZEANYIM:

Q. What's your name?

A. Lyle Lehman.

Q. This is Exhibit Number 12, right --

A. Yes.

Q. -- the one you just --

A. Yeah.

Q. The study was on everything from -- the paper is 133985?

A. Yes, sir.

Q. Can you summarize what that paper says? What relation does it have to do with Section 18?

A. It -- it -- it just sets the stage for the -- so this paper was written in 2010. And before 2010, the work in the Barnett, which GMI was involved in -- which I'm not -- I didn't work for GMI. You know, people got together with geomechanical studies, and the idea that we had to turn the rotation of wells from longitude -- to produce longitudinal fractures to transverse fractures was a function of permeability. It's also a function of viscosity mobility. Really, it's functional mobility. You know, it's --

Q. Yeah, I understand that. But now you analyzed that data and gave us some of your results. How do we then begin to apply it in this township and this section and all this, because as you know, I can drill east-west here and drill north-south?

A. Right.

Q. Does this paper address -- address those?

A. Well, you use the permeability range over on the bottom right.

Q. Is that the permeability?

A. Yeah. So you say, Well, you know, the Bakken is .5. The Bone Spring is close to .05, and you just kind of dial in what the plan would be. It gives you the 30,000-foot view of how you would do it.

Q. Okay. We're trying to extrapolate, right?

A. Yeah. Yeah, just an overarching kind of plan.

Q. You know, because it's my duty to give due process. If I say, Well, let's not hear you, then that might be -- but I'm glad we heard you.

And then you want to extend there -- you just extrapolate into Section 18 or that township, right?

A. Pardon me?

Q. You wanted to use this information (indicating) as an analogy to what we're doing in Section 18?

A. Yes. Right.

Q. That's what I want to understand. Okay. That's good.

EXAMINER EZEANYIM: Mr. Feldewert, do you have any questions?

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Lehman, you mentioned -- I'm looking at Exhibit 12. You talked a little bit about oil recovery. I'm looking at the third page of that exhibit.

A. This one (indicating)?

Q. Yes.

If I'm understanding what you're saying here, these are factors that, from a stimulation standpoint, will affect the recovery of the oil from the

wellbore?

A. Yes.

Q. And so you have to keep these factors in mind when you're doing any kind of a study, correct?

A. Yeah. You can strain the models. You can bias them pretty heavily.

Q. And oil recovery is also dependent on the geology of a particular area; is it not?

A. Yes, it is.

Q. Based on permeability and conductivity and the stimulation method you used, right?

A. Number one is how big is the tank. Number two is the bullet, permeability.

Q. There you go.

And your completion method that you utilized?

A. Yes.

Q. If I look at, for example, Endurance's Exhibit Number 6 -- do you have that in front of you, that colored map right there?

A. Sure, I do.

Q. If you look over there to the right of what they call their sand pile in Section 21 -- there is a Section 21. Do you see that?

A. No. I don't look at these very often.

Q. See where you've got the red circle there?

A. So 21 is in kind of a pink. Yeah, I got it. I got it. I'm with you. I'm with you.

Q. The blue and the green?

A. Yes, sir.

Q. Now, that's kind of a different -- isn't that a different geologic setting that what we see in Section 20?

A. It is, but for me looking at this, Section 20 is -- this map is drawn on the 2nd Bone Spring, and the well in Section 21 is in the 3rd Bone Spring.

Q. Yeah. That came out. I mean, they keep referencing that well in Section 21. First off, it's in the 3rd Bone Spring Sand?

A. That's what I -- that's what this tells me.

Q. And doesn't this tell you, also, that the geology is a little different for that particular well than what you perhaps see in Section 18?

A. Section 18 is to the left.

Q. Let me step back. The geology in that particular area is different than what you would see, for example, in the 2nd Bone Spring, as they map it Section 20 or in Section 19 or down in Section 30?

A. I assume. But you know what, I had one class in geology at O. U.

Q. I understand.

A. I'm not a geologist. I am a stimulation expert.

Q. At least you can see that, correct?

A. Yeah, I think I can. I am a layman, too.

Q. Let's get to what you're talking about.

So I guess my point is the productivity and the success of that well --

A. Uh-huh.

Q. -- that they keep harping on, that east-to-west well --

A. That's the Mewbourne well?

Q. -- could be a factor of the geology, correct?

A. Absolutely.

Q. Could be a factor of the completion methods?

A. More so it's going to be the reservoirs.

Q. More so the reservoirs?

A. Yeah. What you're going to find out is on your mud logs, your heavy gas content is going to describe that reservoir quality better than anything.

Q. Would you agree with me that the fracks that occur during the stimulation process tend to follow the path of least resistance?

A. Absolutely. They have no other choice.

Q. And so knowing the natural fractures would be

important in orienting your well?

A. Yes. They also need to know what their opening pressure is.

Q. If I turn -- if I have you look at our exhibit book, would you look at Exhibit Number 11, please?

A. Oh, I finally get to see it. Okay. This one? Yeah.

Q. Yes. This is the exhibit in which Chevron --

A. Yeah, the 2nd Bone Spring and then the textbook look.

Q. Using seismic, correct?

A. That's what I've been -- that's what I heard today.

Q. And this shows, according to Chevron's expert in geology using seismic, that there is an anticline structure on the top of 18. Do you see that? Remember when we were talking about that?

A. I remember that.

Q. Do you disagree with the fact that if there is an anticline structure, as shown by the seismic, that you're going to have a fold and that you're going to have natural fractures --

A. I've done enough tiltmeter mapping to tell you that is absolutely correct.

Q. That is absolutely --

A. I've done enough tiltmeter mapping in microseismic.

Q. You were asked what circumstances would cause you to drill an east-to-west well. Remember that?

A. Yeah. I said -- and I said, if this was exactly correct (indicating) --

Q. You would drill an east-to-west well, right?

A. I would.

Q. I'm with you on that one.

Now, you also mentioned that -- you seem to have some problem with, generally, east-to-west wells versus north-south wells?

A. Uh-huh.

Q. But, again, that would depend upon geology, would it not, and where you're at, what deposition?

A. It's more the geomechanics. It's a combination of several factors, but geology is probably the bigger umbrella it's going to fit under.

Q. Would you turn to what's been marked as Chevron Exhibit Number 30 for me, please?

A. 30. 30. Okay.

Q. Were you here when Chevron's engineer was on the stand and talked about the studies that he did in areas that had, at least on appearance, similar geology, similar completion methods, similar times frames and

similar lateral length?

A. Right.

Q. And were you here for his testimony where he indicated that in those areas, at least for this study, the east-to-west wells outperformed the north-south? I'm on Exhibit Number 31?

A. Oh, okay. Are you trying to mislead me? You told me 30.

Q. Did I tell you 30?

A. Yeah. She'll (indicating) read it back to you.

Q. Well, we can stay on 30. Which one do you want to --

A. No, no. Let's do 31.

Q. You like 31? Okay. Let's go back. Let's go back to where I was when I said 30. Let's go back to 30.

A. Okay.

Q. Yeah. You were here when he conducted this --

A. Yeah, yeah.

Q. -- right?

And he showed that the east-to-west wells were outperforming the north-south wells?

A. Right. And he gave us a little selective carve-out.

Q. In the area that had similar depositional

features, similar completion methods, similar geology; is that, correct?

A. That's what he said.

Q. Do you have any reason to disagree with it?

A. I have no reason to disagree or agree with it.

Q. Are you surprised by the result by that analysis?

A. I wouldn't -- I am, but I don't think it tells the whole story.

Q. Do you have any other story to tell outside of what's been presented here?

A. Yeah. The only other thing I will tell you is and I didn't -- it's proprietary to Endurance and to Caza, but in my net pressure matching, which you don't seem to be so proud of my ability to do that, I have not seen anything that indicates we have longitudinal fractures. In other words, when we go from the toe to stage 2 to stage 3 to stage 4, I see no collision, any kind of torquing up.

Q. Where?

A. From the data that we're providing.

Q. What data?

A. The frack data.

Q. From where?

A. From the surface company.

Q. I'm trying to figure out where you are. Let's take a look at Exhibit --

A. Let me draw it out for you.

Q. No. Let me ask you. I mean, let's look at exhibit -- the data that you're talking about.

A. It's not -- it's not in any of your exhibits.

Q. It has nothing to --

A. If your wellbore is this way and I'm fracking this way (demonstrating), the only time you see stage 1 talk to stage 2 is if the permeability is high and the fluid invasion into that envelope is in the same area where stage 2 is initiated.

Q. Let me stop you there, Mr. Lehman, because my question is: Are you talking about any data with respect to the area in question, which is Section 18?

A. No.

MR. FELDEWERT: That's all the questions I have.

THE WITNESS: Good enough for me.

MR. PADILLA: Mr. Examiner, I'd tender Mr. Lehman as an expert. I believe he would qualify as an expert in stimulation.

EXAMINER EZEANYIM: We did qualify him as a stimulation expert.

MR. PADILLA: Okay.

EXAMINER EZEANYIM: Are you done?

MR. FELDEWERT: I am. Thank you.

EXAMINER EZEANYIM: Any cross for Mr. Lehman?

It appears we're not going to be done today, so we are going to continue tomorrow. We can't get it done today, because we have three witnesses, right?

MR. PADILLA: Two.

EXAMINER EZEANYIM: We will continue tomorrow with this, because this is very important. We'll continue at 9:00 a.m. tomorrow. We have an engineer, again, coming?

MR. RITTER: Yes.

EXAMINER EZEANYIM: And a land person?

MR. RITTER: Yes.

EXAMINER EZEANYIM: Because I think it's fair -- I'm talking to both counsels -- for us to hear everybody, since we're cutting it off here, because there is no way we can finish by 5:00. So I hate to do that, but we have to do it tomorrow. I have to cancel my schedule. I have a meeting tomorrow, but I'm going to cancel it and continue this at 9:00. Hopefully by 10:00 or 11:00, we can be done, hopefully, you know. Is that going to pose to anybody -- of course, we need to

do it. We have to complete it. We're not done.

THE WITNESS: Are you done with me?

EXAMINER EZEANYIM: No. Well, I wanted to see before I get an agreement.

MR. PADILLA: That's fine.

EXAMINER EZEANYIM: Mr. Feldewert, what do you think? I know you have some work to do tomorrow.

MR. FELDEWERT: Mr. Examiner, I understand you're canceling an appointment you have at 9:00 tomorrow.

EXAMINER EZEANYIM: No, no. I have an appointment, but I'm going to cancel it, so we can continue at 9:00.

MR. FELDEWERT: I had an appointment at 9:00, but I can get that canceled if that's --

EXAMINER EZEANYIM: Because we need to finish. I'm sorry. I have to give due process to everybody. I don't want to cut somebody off. That might, you know, give you an opportunity to say mistrial, even though this is not a trial.

So is it okay if we continue tomorrow at 9:00?

MR. PADILLA: Yes.

EXAMINER EZEANYIM: Okay. The record will reflect that we are going to continue at 9:00 tomorrow.

I'm sorry you have to cancel.

MR. FELDEWERT: That's fine.

EXAMINER EZEANYIM: We need to do this.

I'm interested in your work. Why did you decide to use this paper?

THE WITNESS: Because it sets up the story. It illustrates the, you know --

EXAMINER EZEANYIM: That's what I wanted to hear. I'm done with you for now. Thank you.

I hope to see everybody, because it might be necessary to recall somebody, so I think it's important that everybody shows up again tomorrow.

(Discussion off the record.)

EXAMINER EZEANYIM: This concludes today. See you guys by 9:00 in the morning, same room.

(The proceedings recessed, 4:34 p.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case 15074 heard by me on 3/27/2014

Examiner

Oil Conservation Division

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STATE OF NEW MEXICO

COUNTY OF BERNALILLO

CERTIFICATE OF COURT REPORTER

I, MARY C. HANKINS, New Mexico Certified Court Reporter No. 20, and Registered Professional Reporter, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings that were reduced to printed form by me to the best of my ability.

I FURTHER CERTIFY that the Reporter's Record of the proceedings truly and accurately reflects the exhibits, if any, offered by the respective parties.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this case.

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