STATE OF NEW MEXICO
ENERGY, MINERAL AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

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

APPLICATION OF KAISER-FRANCIS OIL COMPANY FOR POOL CREATION AND SPECIAL POOL RULES, LEA COUNTY, NEW MEXICO

CASE NOS 15823-15824

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

September 14, 2017

SANTA FE, NEW MEXICO

BEFORE: WILLIAM V. JONES, CHIEF EXAMINER
DAVID K. BROOKS, LEGAL EXAMINER

This matter came on for hearing before the New Mexico Oil Conservation Division, William V. Jones, Chief Examiner, and David K. Brooks, Legal Examiner, on Thursday, September 14, 2017, 9:08 a.m., at the New Mexico Energy, Minerals and Natural Resources Department, Wendell Chino Building, 1220 South St. Francis Drive, Porter Hall, Room 102, Santa Fe, New Mexico

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BY: J. SCOTT HALL

EXAMINER JONES: Let's call Case Number 15821 and 15822. Both are Application of Kaiser-Francis Oil Company for Pool Creation and Special Pool Rules, Lea County, New Mexico.

Call for appearances.

MR. BRUCE: Mr. Examiner, Jim Bruce, of Santa Fe, representing the applicant. I have three witnesses.

EXAMINER JONES: Other appearances?

MR. HALL: Scott Hall, Montgomery and Andrews Law Firm, Santa Fe, appearing on behalf of Energen Resources Corporation.

I have no witnesses.

EXAMINER JONES: Will the three witnesses please stand, and the court reporter swear the witnesses?

[Whereupon, Barbara Courtney, Chris Miller and Mike Raines were duly sworn.]

EXAMINER JONES: Are these the same witnesses that are on your preparing statement?

MR. BRUCE: Yes.

EXAMINER JONES: Okay.

BARBARA COURTNEY

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name and city of residence for the record?

A. Barbara Courtney, Tulsa, Oklahoma.

Q. Who are you employed by, and in what capacity?

A. Kaiser-Francis Oil Company. I'm a landman.

Q. Have you previously testified before the Division?

A. I have.

Q. And were your credentials as an expert petroleum landman accepted as a matter of record?

A. They were.

Q. And are you familiar with the land matters involved in these applications?

A. Yes.

MR. BRUCE: Mr. Examiner, I tender Ms. Courtney as an expert petroleum landman.

EXAMINER JONES: Any objection?

MR. HALL: No objection.

EXAMINER JONES: She is qualified as an expert in petroleum land matters.

Q. (By Mr. Bruce) Ms. Courtney, could you identify Exhibit 1 for the Examiner? First of all, these cases involve the Bell Lake Unit, what are known as in this the North Bell Lake.

Could you give the Examiner just a little information on the Bell Lake Unit?

A. We're doing north first or south first?

Q. North.

A. The Bell Lake Unit was formed in 1953, and it covered over 37,000 acres of land. Over the years, it was contracted down into two nine-section blocks. They're not contiguous, so they were named -- it's actually participating areas, but we call them Bell Lake North and Bell Lake South.

Exhibit 1 is just a plat showing the nine sections in the Bell Lake Unit. The attachment to it are the legal descriptions of those nine sections.

Q. And what type of land is in the North Bell Lake Unit?

A. The North Bell Lake Unit is all state and federal acreage.

Q. And what does Kaiser-Francis seek in this case, briefly?

A. The creation of new pools for horizontal Bone Spring and Wolf Camp Development in the North Bell Lake

North Unit and special pool rules for the new pools.

Q. Could you summarize what -- first of all, I'm going to have you describe what Kaiser-Francis is doing.

Do we have technical witnesses who are going to support that testimony?

A. We do. We have an engineer and a geologist who will testify.

Q. Okay. Could you identify Exhibit 2 and briefly run through that?

A. Exhibit 2 is that Kaiser-Francis requests special rules and regulations be established for horizontal wells in the Bone Spring pool, and the second page is for horizontal wells in the Wolfcamp pool.

But for the Bone Spring, we want a standard oil spacing and proration units of 480 acres, wells to be located no closer than 330 feet from the exterior boundary of the nine section units, 100 feet from the interior north/south boundaries of a standard well unit, with interior setbacks of 50 feet from a quarter-quarter section line for the beginning of a wells producing interval.

A special depth bracket allowable of 9,600 barrels of oil per day for a standard 480-acre unit and --

Q. And that's for the Bone Spring pool?

A. For the Bone Spring pool; that's right.

-- a GOR of 5,000 cubic feet of gas per barrel of oil, and all other rules in conformance with statewide rules.

And for the Bone Spring, we request 6,000 barrels of oil per day for a standard 480-acre unit. The plat attached just shows that.

MR. BRUCE: Another witness will discuss this. But the two pools, Mr. Examiner, in the South Bell Lake are called the South Bell Lake Wolfcamp and South Bell Lake Bone Spring.

Another witness will discuss his discussions with Mr. Kautz and with the BLM on those.

EXAMINER JONES: Okay. You knew we were going to ask that.

Q. (By Mr. Bruce) And the top page of the exhibit, does that just visually set forth the setbacks you are seeking?

A. It does.

Q. And do you ask that these pool rules be applicable only within the unit area?

A. Yes.

Q. And why does Kaiser-Francis seek the creation of these pools and the institution of the pool rules?

A. Well, we're planning the Bone Spring and

Wolfcamp wells beginning next year, and this plan includes drilling more than four wells, and each prospective zone in a mile-wide area. Without special rules, many in-field wells would otherwise be unorthodox, so this gives us more operational flexibility.

Because of the number of wells planned and the increased productivity of horizontal wells, an increase in the oil allowable is needed.

Q. And will the rules only apply to horizontal wells?

A. Yes.

Q. And any existing or future vertical wells would be subject to spacing as set by the Hobbs office; is that correct?

A. That's correct.

Q. What is Exhibit 3?

A. Exhibit 3 is a list of all working interest owners, royalty owners, overriding royalty owners and nonparticipating royalty owners and offset operators within the nine sections for the royalty owners, and then a mile around are all the offset operators.

Q. And what is Exhibit 4?

A. Exhibit 4 shows the offset operators and their locations.

Q. Okay. And again, they are listed in Exhibit 3?

A. They are.

Q. And this -- to clarify, Kaiser-Francis is the operator of the North Bell Unit?

A. We are.

Q. And so you have land records at your headquarters in Tulsa?

A. We do.

Q. Did you do a subsequent examination to determine who should be notified about this hearing?

A. We did. I had the records checked.

Q. Okay. You had the county records checked and Internet records checked also?

A. Correct.

Q. And there have been a number of -- over 60-plus years, there have been a number of ownership changes; have there not?

A. Yes, sir.

Q. In your opinion, have you made a good-faith effort to locate everyone entitled to notice of these applications?

A. Yes, I have.

MR. BRUCE: Mr. Examiner, Exhibit 5 is simply my Affidavit of Notice to the interest owners. I did not include all the green cards. I'm going to ask

that the cases be continued for two weeks, because I want to verify that everyone received notice, either by mail or by publication. You know, there was about 90 or 100 people notified, so I just want to make sure of that.

EXAMINER JONES: That's a lot of people.

MR. BRUCE: Yeah.

EXAMINER JONES: Wow.

MR. BRUCE: But what this does contain is the -- you can see everyone is listed. But I need to just make sure that everyone has received notice, so I'd ask that the cases be continued for two weeks just for notification purposes.

EXAMINER JONES: Okay.

Q. (By Mr. Bruce) Ms. Courtney, were Exhibits 1 through 4 prepared by you or under your supervision?

A. Yes.

MR. BRUCE: Mr. Examiner, I'd move the --

Q. (By Mr. Bruce) And in your opinion, is the granting of these applications in the interest of conservation and the prevention of waste?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 1 through 5.

MR. HALL: No objection.

EXAMINER JONES: Exhibits 1 through 5 are admitted.

Mr. Hall?

MR. HALL: No questions.

EXAMINER JONES: So this was originally, in 1953, the Bell Lake Unit?

THE WITNESS: It's still the Bell Lake Unit.

EXAMINER JONES: It's still officially the Bell Lake Unit?

THE WITNESS: Yes, sir.

EXAMINER JONES: But you just -- nomenclature, everybody calls it north, and then the south?

THE WITNESS: Well, when it was split, there's nine sections, and then there's nine sections open, and then there's nine more sections. So they separated it out and did separate operating agreements with different working interest owners in each nine-section block.

EXAMINER JONES: Okay. Is Kaiser-Francis the operator of record of that unit?

THE WITNESS: Of the entire unit, yes.

EXAMINER JONES: Of the unit, meaning the north and the south?

THE WITNESS: Yes.

EXAMINER JONES: So that means that you administer -- it was easy to find who were the owners then, correct?

THE WITNESS: Yes, it was, because we have a lot of other production, and we have royalty revenue records.

EXAMINER JONES: But what sort of unit is this? It's a federal --

THE WITNESS: It's a federal exploratory form.

EXAMINER JONES: It's on a federal form, though?

THE WITNESS: It's an old, old --

EXAMINER JONES: An old, old federal form.

So is it amenable to being expanded or contracted, and why did it contract when it did?

THE WITNESS: Because there was an uneconomic well drilled in the nine sections between the north block and the south block. I mean think it was contracted down over the years, but the last thing that separated the two nine-section blocks was an uneconomic well by federal standards that was drilled in the nine-section block, so that was taken out.

EXAMINER JONES: Okay. Does it have any

segregation clauses on the leases, or is it the typical federal modified segregation clause?

THE WITNESS: I think they're old regular federal leases from the '40s and '50s, and then there are state leases as well. And there are a few fee leases on in the north, though. We're talking north. It's all state and federal.

EXAMINER JONES: So there is some fee acreage --

THE WITNESS: In the south.

EXAMINER JONES: In the south, okay.

Is it an all-depths unit?

THE WITNESS: Yes, in the north.

EXAMINER JONES: In the north?

THE WITNESS: (Nods head.)

EXAMINER JONES: But not in the south?

THE WITNESS: The unit covers all the acreage. But the operating agreement, when it was segregated out and made the nine-section blocks, it's below 9,000 feet.

EXAMINER JONES: Okay, it's only below 9,000 feet. So what formations are above 9,000?

We'll talk about that later, if I don't forget to ask it.

THE WITNESS: I should clarify that the

leases are all held to all depths. The working interest ownership is 9,000 and below.

EXAMINER JONES: Okay. So you've got divided -- is there a different owner?

THE WITNESS: Only working interest ownership, but 9,000 feet covers most of the formations we're seeking to drill.

EXAMINER JONES: Okay. So as far as -- I'm not going to really ask you about the pool yet, but the pool is going to be contiguous with the unit boundaries?

Can you answer that?

MR. BRUCE: That is correct.

EXAMINER JONES: So the unit boundaries are not going to change in the future.

THE WITNESS: No.

EXAMINER JONES: It's pretty much set on those?

THE WITNESS: They are.

EXAMINER JONES: So how many PAs exist out here?

THE WITNESS: Well, in the north unit, there's one Devonian, nine-section PA.

EXAMINER JONES: Okay.

THE WITNESS: And then we have some other wells that are drilled on 40-acre state wide spacings.

EXAMINER JONES: Okay. So the other wells are leased wells, then?

THE WITNESS: Uh-huh.

EXAMINER JONES: So basically, it's a Devonian PA --

THE WITNESS: It is.

EXAMINER JONES: -- in the north?

THE WITNESS: But it's still -- the whole unit is still a Devonian PA.

EXAMINER JONES: It was originally a Devonian target, then?

THE WITNESS: Yes.

EXAMINER JONES: Okay. So guess --

MR. BRUCE: Mr. Examiner, I made one mistake. I'm thinking top to bottom. So we just presented testimony on the North Bell Lake Unit.

EXAMINER JONES: Yes.

MR. BRUCE: And actually, the first two cases are the South Bell Lake Unit, so if we could just change that. The case is called 823 and 824.

MR. BROOKS: Are we doing a consolidated hearing on all four cases?

MR. BRUCE: No, no, no.

MR. BROOKS: So which case are we hearing now --

MR. BRUCE: 823 and 824.

EXAMINER JONES: Yeah. Please let the court reporter reflect that instead of -- we called Cases 15821 and 15822. Instead, we were meant to call 15823 and 15824.

MR. BROOKS: Do you need to go back, Mr. Bruce, and ask any further questions of the witness to get this testimony be relevant to the cases we're actually hearing?

MR. BRUCE: Yeah.

Q. (By Mr. Bruce) The exhibits you were testifying off of and the testimony you were giving were strictly for the North Bell Lake Unit?

A. That's correct.

MR. BRUCE: Mr. Examiner, the pools for the North Bell Lake Unit are actually the Southwest Ojo-Chiso Bone Spring and Wolfcamp pools.

EXAMINER JONES: Okay.

MR. BROOKS: Mr. Bruce, do you need to present additional testimony with this witness to make it relevant to the cases we're actually hearing, then?

MR. BRUCE: No. We testified solely on the North Bell Lake Unit.

MR. BROOKS: When you said you testified to the North Bell Lake Unit, that's what I heard, right?

MR. BRUCE: Yes.

MR. BROOKS: So which cases are we hearing?

EXAMINER JONES: The North Bell Lake, 823 and 824.

MR. BROOKS: So we're hearing 823 and 4?

MR. BRUCE: Yes.

MR. BROOKS: Okay. And it's not a consolidated hearing?

EXAMINER JONES: These are consolidated. These two cases are --

MR. BROOKS: But not for all four?

EXAMINER JONES: Not or all four.

MR. BROOKS: Okay. Are you passing the witness again?

MR. BRUCE: Yes.

MR. BROOKS: Okay.

And do you have anything further?

EXAMINER JONES: No.

MR. BROOKS: And we're talking about the South Bell Lake Unit?

EXAMINER JONES: North.

MR. BROOKS: Yeah, that's what we've been talking about. Okay. You'll have to pardon me because I just came back from vacation, and I have not had a chance to prepare on today's cases at all.

What you're asking for, if I understand it correctly, is the formation of a pool, a new pool; is that correct?

THE WITNESS: Yes, sir.

MR. BROOKS: And it's in the Bone Spring?

THE WITNESS: And Wolfcamp.

MR. BROOKS: Okay. So one pool for those two formations?

THE WITNESS: One pool for each.

MR. BROOKS: It's a Bone Spring pool and a Wolfcamp --

MR. BRUCE: Case 823 is the Bone Spring, and Case 824 is the Wolfcamp.

MR. BROOKS: But they're going to have the same horizontal boundaries?

THE WITNESS: Yes.

MR. BROOKS: And the horizontal boundaries will coincide with the boundaries of the North Bell Lake Unit?

THE WITNESS: Yes.

MR. BROOKS: As far as -- you know, you've given notice to all the offsets, and I gather they're not concerned about it, but this is in a developed area. Are there other pools that will be surrounding this so that this won't -- this pool will not expand or --

MR. BRUCE: This pool will not expand unless the Division -- we're not asking -- we're asking it to be a frozen pool.

MR. BROOKS: Okay. So you want the order to say it's a frozen pool?

MR. BRUCE: That's correct.

MR. BROOKS: Now --

MR. BRUCE: There are other primarily Bone Spring pools outside of the units.

MR. BROOKS: Yeah. I would have assumed there were, given the fact there's been a lot of development in the area. But I, of course, don't know the boundaries of the various pools.

EXAMINER JONES: Nobody does.

MR. BROOKS: Except Paul Kautz.

There was something said about allowance. Is that part of this case?

THE WITNESS: Yes, sir. We were asking for 9,600 barrels a day for the Bone Spring and 6,000 barrels a day Wolfcamp, for each 480-acre unit.

MR. BROOKS: Okay. So the 480-acre, is that going to be a standard unit in this pool?

THE WITNESS: Yes.

MR. BRUCE: And our next witness will discuss the primary reason for that.

MR. BROOKS: Okay. So you want -- allowable is set for the pool?

THE WITNESS: Yes, sir.

MR. BROOKS: What is going to be the allowable for a vertical well if a vertical well were drilled within this area? It won't be in the same pool?

MR. BRUCE: No. It would just be whatever Mr. Kautz fixes it in. We wouldn't expect there to be much vertical drilling.

MR. BROOKS: I wouldn't expect there to be much vertical drilling, either, but I have a conceptual problem with how you can have the same pool split up for allowable purposes in two different ways, depending upon how -- well, I'm not articulating very well.

When vertical and horizontal wells are drilled from the same formation within the same area, I have a problem if their allowables do not add up to 100 percent. Because the purpose of allocating the -- the conceptual purpose of allowables doesn't seem to apply once you go in that direction.

Say you base vertical wells on one formula and you base horizontal wells on another formula. And I realize we have that problem throughout the state --

MR. BRUCE: Yeah. I think --

MR. BROOKS: -- as well --

MR. BRUCE: -- the mitigating --

THE REPORTER: Excuse me. I need one person speaking at a time, please.

MR. BROOKS: Go ahead.

MR. BRUCE: Well, you know, this is all within one unit area, number one. Number two, there might be one vertical well in the north or south unit. It's an older well.

Once again, you're dealing with all the same interest owners. So I don't see...

MR. BROOKS: Well, this is a conceptual problem that I have because I like things to make sense. But of course if they work, they don't have to make sense. If they make sense, but they don't work, that's problematic.

MR. BRUCE: Well, if this was, for instance, down in the Yeso area down in southern Eddy that people are drilling tons of vertical and -- or were, tons of vertical and horizontal wells, I can see what you're getting at.

MR. BROOKS: Well, that was the same problem we had up in the Mancos and, of course, in the northwest. And of course, that's another case where people were drilling.

MR. BRUCE: Yeah. And there's nobody out

here drilling vertical wells.

MR. BROOKS: No, not that I'm aware of.

MR. BRUCE: Like I said, I think there might be one existing vertical well sitting somewhere in the unit areas. A geologist or engineer can probably testify about that, but we don't have any allowable issues, either.

MR. BROOKS: Yeah. So the only issues -- the issues in this case are spacing and allowables, right?

MR. BRUCE: Yes.

MR. BROOKS: You want to have this new pool to define new spacing rules, spacing and setback rules, and to have an increased allowable, right?

MR. BRUCE: Correct.

MR. BROOKS: Okay. I guess that's all I had.

EXAMINER JONES: I've got one more question. Speaking of interest being all the same, it's a 1953 federal form, and you have a Devonian PA. But as you drill these other wells, are you going to -- did you talk the BLM into changing this into an all-PA Bone Spring and an all-PA Wolfcamp?

MR. BRUCE: I think our geologist can testify further about that.

THE WITNESS: We have talked extensively with the BLM, and they can tell you that.

EXAMINER JONES: So the geologist will talk about the contract being changed? He would agree --

MR. BRUCE: Well, about the PA.

EXAMINER JONES: About the PA, okay.

Thank you very much.

THE WITNESS: Thank you.

[Whereupon, Ms. Courtney was excused.]

CHRIS MILLER

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name and city of residence for the record?

A. Chris Miller, C-h-r-i-s, Tulsa, Oklahoma.

Q. Who do you work for, and in what capacity?

A. Kaiser-Francis Oil Company. I'm a geologist.

Q. And have you previously testified before the Division?

A. I have not.

Q. Can you please summarize your educational and employment background for the Examiner?

A. I received a Bachelor of Science in Geological

Engineering from Montana Tech in 1985, a Master's of Science and Geology from the University of Tulsa in 1989, and I've been employed with Kaiser-Francis Oil Company since 1989.

Q. And does your area of responsibility at Kaiser-Francis include this portion of Southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the geologic matters related to both the North and the South Bell Lake units?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender my witness as an expert petroleum geologist.

MR. HALL: No objection.

EXAMINER JONES: He is so qualified.

Q. (By Mr. Bruce) Would you please identify, although it's been previously submitted -- well actually, we've taken your exhibits and have made them all one exhibit with the pages numbered. Why don't you just start with page 1 and start running through the unit and the productive zones, and the reasons why you are asking for the special pool rules?

A. All right. Exhibit 6, page 1, shows an outline of the North Bell Lake nine-section contiguous unit in Lea County. We have not drilled a horizontal well

within the North Bell Lake Unit yet.

Exhibit 6, page 2, shows the stratigraphic column of the Delaware Basin and how we propose to define the pool definition for the Bone Spring interval and the Wolfcamp interval of North Bell Lake.

These definitions have been discussed pretty thoroughly with the BLM and Paul Kautz, and both the BLM and Paul Kautz agree with these definitions that we propose at North Bell Lake.

Q. And have they also agreed that these pools should apply strictly within the unit area?

A. Yes, they will apply only to the unit area. We're proposing two new pools in North Bell Lake. The first one would cover the entire Bone Spring interval, both the upper Bone Spring and lower Bone Spring. It would be the Ojo Chiso Southwest Bone Spring pool.

The second pool we're proposing would be the Ojo Chiso Southwest Wolfcamp pool, defined as the interval from top of the Wolfcamp to the top of the Strawn in North Bell Lake.

MR. BRUCE: Getting back to the Examiner's question, have you discussed with the BLM about forming both a Bone Spring PA and a Wolfcamp PA for the North Bell Lake Unit?

A. Yes. Those discussions have been ongoing for

the past two years, and we've talked about the South Bell Lake. We've actually drilled a horizontal well down there. The process will be to -- we were hoping actually to drill a single well in North Bell Lake and/or South Bell Lake. And since there was so much analogous production around us, we were hoping that the single well would allow us to form a nine-section PA with that one well.

There had been some changes in the BLM managerial-wise, and the new person there -- I forget his name, I'm sorry, but --

EXAMINER JONES: James Glover?

THE WITNESS: Mike, our engineer, will know his name.

EXAMINER JONES: Okay.

A. He's more thought of -- he probably won't give us a nine-section PA with that one well. We'll probably have to drill one or two or three wells before we can get the entire nine sections into a formal Bone Spring PA and/or Wolfcamp PA.

Paul is on board with all that. The BLM actually wanted us to combine the Bone Spring and the Wolfcamp for PA purposes. Paul didn't want to do that, obviously, so Paul allowed us to combine the entire Bone Spring, instead of having to break that up. So we have

a Bone Spring and a Wolfcamp definition. So we'll have to form PAs for the Bone Spring and the PAs for the Wolfcamp.

Q. We'll move on to your page 3, please.

A. Page 3 is a cross-section. If we go to page 4 -- if you'll look at page 4, page 4 shows the location of the cross-section. This cross-section runs across North Bell Lake.

The well to the left is the western-most well. That's a well off the unit. The middle well and the cross-section is a well directly in the middle of the North Bell Lake Unit, and then the eastern-most well is a well off of our unit.

The cross-section simply shows the continuity of the Bone Spring interval from the lower Avalon to the Wolfcamp, and the Wolfcamp interval to the Strawn, all continuous across the entire mountain section area.

Staying on page 4, this just shows the structure map of the upper Avalon -- or top of the Bone Spring interval, showing a structural high basically in the center of our unit there.

The most important thing to see on this map is there's no faulting in the Bone Spring interval, so it's structurally continuous across the entire

nine-section unit.

Going on to pages 5 and 6, these are the VH maps of the second Bone Spring and third Bone Spring intervals.

Q. Are those the Bone Spring zones you would likely test first?

A. Yes. We're testing the second Bone Spring first. The second Bone Spring and the third Bone Spring have been developed pretty much all around our units, and they have the most definition in terms of production. We have really good analogies for what we can expect in the North Bell Lake area and South Bell Lake.

So the VH maps simply show a continuous reservoir thick enough for economic reserve and similar in thickness to all of the analogous production surrounding it. So we expect to get similar production from our Bone Spring interval as our offset producers show. These maps were created just using an 8 percent density/porosity cutoff and just VH maps of those two.

Now, I should say that there are at least five prospective reservoirs in North Bell Lake. I'm only showing two just for simplicity, but these are the two most likely reservoirs that we go to first.

Q. The first two Bone Spring obviously go to --

A. Yes.

Q. -- and continue on with the next couple of pages regarding the Wolfcamp.

A. All right. Page 7 is just a structure map on top of the Wolfcamp. And again, we still see the same structural high on the center of the unit there. Also notice that there is no faulting on this structure map, indicating continuity -- structural continuity across the entire nine-section unit.

Page 8 shows a VH map of the Wolfcamp pay interval, again continuous across the unit and analogous to the closest production to our unit, which is a few miles to the northeast and a few miles southwest of us here in North Bell Lake.

Q. So the Bone Spring is continuous across the north unit, correct?

A. Yes.

Q. And so is the Wolfcamp?

A. Yes, it is.

Q. And you believe that all of the acreage within the unit, the north unit is prospective in both the Bone Spring and the Wolfcamp?

A. I do, yes.

That pretty much is all the geological exhibits I have for North Bell Lake.

Q. Was Exhibit 6 prepared by you or under your supervision?

A. Yes, it was.

Q. In your opinion, is the granting of the applications on the north unit in the interest of conservation and the prevention of waste?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibit 6.

MR. HALL: No objection.

EXAMINER JONES: Exhibit 6, with the five pages --

THE WITNESS: That's eight, I believe.

EXAMINER JONES: -- eight pages is admitted.

Mr. Hall?

MR. HALL: I have no questions.

EXAMINER JONES: I guess before I forget, when will you know about this PA business? Is it Chris Wahls, or is it --

THE WITNESS: It's Chris, Chris Wahls, yes.

So what we're going to do is -- and Mike is really more in charge of doing this. But in summary, what we're going to do is we have a well in South Bell Lake, and it's been on production for almost three

months. After six months, we are going to apply for the large PA and see what happens. So they'll turn it down, most likely -- hopefully not, but they'll probably turn it down. Then they'll grant us, and hopefully we'll get approval for these field rule pool definitions.

So what will likely happen is we'll get a 480-acre PA for that well up in the northeast part of the unit, and then we're going to come over and drill wells on the west side of the unit. So drill them, complete them, produce them for six months, see if we can get a nine-section PA on every well we drill until we get our nine-section PA.

EXAMINER JONES: Is the well locations an issue with you, as far as -- that's probably an engineering question anyway. But geologic-wise, do you want --

THE WITNESS: Well, to be honest with you, our first well locations -- I think the geologic setting is better to the west of where we drilled, but there's more law control where we drilled. You know, we started planning this three or four years ago, so we wanted to stay close to our control.

But the other reason is that we did have and we do have second Bone Spring and third Bone Spring wells pretty much all around us there, right.

EXAMINER JONES: Uh-huh.

THE WITNESS: So if we drilled a well in the northeast quadrant of the unit, you could show us product from there all the way across the unit, and that was the main reason -- one of the main reasons for drilling it.

Now, Chris has taken over from -- I forget who was before Chris, but we were kind of under the impression that we would get a nine-section PA before Chris took over. We don't see a problem with it at all. We're going to get a nine-section PA. The production is way too good out here to worry about drilling an economic well.

EXAMINER JONES: Okay. The owners in this unit, they didn't pose -- you haven't had any -- you have one appearance here today, and I forgot who you're appearing for.

MR. HALL: Energen.

EXAMINER JONES: Energen. Anyway, it's Mr. Brooke's question, so I'll -- in other words, the application here today, did it protect the owners of the unit if the unit is converted into an all PA from the beginning? Is there any downside to them sharing in production?

MR. BRUCE: That's why we notified

everyone. I mean I think if you'll look strictly at the Division's notice rules, we could have gotten away with a lot less notice. But we wanted everyone in the unit, both unit areas, to know exactly what Kaiser-Francis was doing.

I think Ms. Courtney could state this, but I think she and I have gotten a number of emails and phone calls from people just asking what was going on, and they say, "Well, that's fine with us."

EXAMINER JONES: Everybody wants a share of every barrel produced out there?

MR. BRUCE: That's right.

EXAMINER JONES: And the people that own the interest in the first 480 are okay with sharing with the rest of the people because they know that more development will happen, hopefully.

MR. BRUCE: Yes.

EXAMINER JONES: Okay. But your well locations -- I'll ask the engineer about that, within a 480. In other words, because if it's all one PA, from our standpoint, that means you can locate the wells close to the edge without getting an off-standard location exception. So it helps you that way.

THE WITNESS: Yes. We'll stay 330 from the exterior line, but would like the flexibility of being

100 feet from the interior boundary. Just flexibility.

EXAMINER JONES: Okay. Why do you want to drill mile-and-a-half wells out here?

THE WITNESS: Well, if you look at the layout -- and Mike, our engineer, can expand on this -- mile-and-a-half laterals are -- that's a good length to drill. It's very economical, it's sufficient. So it's a great thing for us to just cut this unit in half and drill north a mile and a half and drill south a mile and a half, and have our central corridor. It's a really beautiful situation. The lateral length is perfect.

If you start messing with drilling one-mile laterals anywhere, then it kind of messes everything else up.

EXAMINER JONES: Okay.

THE WITNESS: If you drill two-mile laterals, for instance, then you're stuck with a one-mile lateral somewhere in the nine-section, so we're just going to stick with a nice one-and-a-half-mile pattern.

EXAMINER JONES: Okay. We didn't ask Ms. Courtney, but are you aware of any surface restrictions to putting your locations in the very center of this?

THE WITNESS: There are very few. But what

restrictions there are, we've been dealing with the BLM, with surveyors and BLM.

EXAMINER JONES: Okay. It's Lea County, so --

THE WITNESS: It's Lea County. So Mike sends in a Plan of Development to the BLM every year, showing exactly what we're thinking and where everything is going to go. So we go down to Carlsbad and meet with them and talk with them.

EXAMINER JONES: Okay. So what happens if you don't get your well out to mile and a half? You're not proposing here rules that would actually require -- I guess you would need an Auster spacing unit; is that correct.

MR. BRUCE: Well, Mr. Examiner, I think if the standard unit is 480 acres, the next witness will discuss how many wells they're going to drill. Basically, take the second Bone Spring and drill three across each well unit. And if it's a single well unit and you make a mile-and-a-half well with at least one of them --

EXAMINER JONES: Okay.

MR. BRUCE: -- which seems reasonable where they're going to be, the 480 ought to be left to it.

EXAMINER JONES: Okay. It sounds like you

figured we'd ask that.

So you've got five prospective reservoirs, and it goes right from the Wolfcamp into the Strawn. There's no upper pin here?

THE WITNESS: No. It really thins up on that structure that we're on.

EXAMINER JONES: Okay.

THE WITNESS: Yeah. There is no Wolfcamp C or D in stuff out here. It just ends up to the Strawn. Paul and I talked about that a little bit.

EXAMINER JONES: Okay. And the oil area, it's just definitely oil?

THE WITNESS: Yeah.

EXAMINER JONES: Do you know where the Wolfcamp ends and the Bone Spring begins, moving uphole? I mean, is it real easy to pick?

THE WITNESS: Yes, real easy.

EXAMINER JONES: And you and Paul agree to the picks?

THE WITNESS: Yes.

EXAMINER JONES: As far as legacy wells, are there any vertical wells you're using from the Bone Spring or the Wolfcamp out here?

THE WITNESS: If you'll look at page 2, I think there are -- I think this is in South Bell Lake,

so this is not really -- there are two old vertical wells -- I think they're in South Bell Lake -- that are in the Bell Lake/Bone Spring pool. And those wells are drilled into what I have listed here as the upper Avalon on page 2.

EXAMINER JONES: Okay.

THE WITNESS: So if you can envision a vertical well drilled into the upper Avalon and perforated in the upper Avalon.

The problem with that pool, with changing that particular pool into what we want, is the pool definition stops at the top of the lower Avalon. So it only takes that tiny little -- well, upper Bone Spring interval, and that's the pool definition.

EXAMINER JONES: Okay.

THE WITNESS: So it's really not bothersome because they're old wells. They're on their last leg. So we just decided to make this more of a horizontal order, hopefully. We don't anticipate drilling a well like that again.

EXAMINER JONES: That Avalon, is it a conventional reservoir kind --

THE WITNESS: Yes, it's a conventional reservoir on that structural high that you see out there.

EXAMINER JONES: Okay. What about in the legacy horizontal wells; it's just the one well?

THE WITNESS: Just one well in South Bell Lake.

EXAMINER JONES: So they've agreed to make that into the defining well, or whatever the BLM calls it, the beginning well in the --

THE WITNESS: Well, we had --

EXAMINER JONES: -- the required well or whatever the name of it is?

THE WITNESS: Are you talking about the pool definition or --

EXAMINER JONES: Well, for the --

THE WITNESS: We had to put that well in a different pool name. You know, Paul Kautz gave us -- actually, I can never remember the name of that pool, but I think it's -- it's the pool name that's surrounding South Bell Lake.

EXAMINER JONES: Okay.

THE WITNESS: So we put it in that pool. And hopefully, once we get this approved, we're just going to sundry the pool name of that well into what we want here.

Does that answer your question?

EXAMINER JONES: Yes.

And the owners that have been noticed, because everybody was noticed, so all those owners will understand they're going to start sharing with everybody else.

THE WITNESS: Yes.

EXAMINER JONES: But it's an older well? It's been there a long time; is that correct?

THE WITNESS: The vertical well?

EXAMINER JONES: No, that horizontal.

THE WITNESS: Oh, no, no. That's a brand new well.

EXAMINER JONES: A brand new well?

THE WITNESS: Yeah. It just started producing last June.

EXAMINER JONES: And your well control you've got out here, is that from the Devonian wells that were drilled?

THE WITNESS: Yep. Yep, pretty much.

EXAMINER JONES: So you've got decent logs?

THE WITNESS: We've got good enough logs. You know, when we drilled our first horizontal well in South Bell Lake, we did a vertical pilot hole through the Wolfcamp and ran Schlumberger's greatest logs and cored -- you know, took some vertical cores, sidewall vertical cores. And then we came up and drilled our

second Bone Spring well, and we're going to do the same at North Bell Lake. That's what we call the pilot well, where we get a lot of geologic information. That's a little better than the old '70s, '80s triple combo logs we had.

EXAMINER JONES: Okay, but it's not called platform express anymore? It's called something different?

THE WITNESS: No, it's not.

EXAMINER JONES: They changed the name just to sell more --

THE WITNESS: It's hard to keep up with it, to be honest with you.

EXAMINER JONES: Okay. Any more questions?

MR. BROOKS: Well, I have a lot more questions, but I don't know that I'm going to get any more answers, so I think I'll pass the witness.

EXAMINER JONES: Okay.

Thanks, Mr. Miller.

THE WITNESS: Thank you.

[Whereupon, Mr. Miller was excused.]

MIKE RAINES

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Could you please state your name and city of residence?

A. Mike Raines, Tulsa, Oklahoma.

Q. Who do you work for, and in what capacity?

A. I work for Kaiser-Francis Oil Company as a petroleum engineer.

Q. Have you previously testified before the Division?

A. No.

Q. Could you please summarize your education and background for the Examiner, please?

A. I graduated from Oklahoma State University in 1984 with a Bachelor of Science in Petroleum Engineering.

Q. And what has been your employment since then?

A. I worked for Amarada Hess for 18 years, and I've worked for Kaiser-Francis Oil Company for the last 15 years.

Q. Does your area of responsibility at Kaiser-Francis include this portion of Southeast

New Mexico?

A. Yes, it does.

Q. And are you familiar with the engineering matters related to the North Bell Lake Unit Applications?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Raines as an expert petroleum engineer.

EXAMINER JONES: I'm sorry, how do you spell your name?

THE WITNESS: R-a-i-n-e-s.

EXAMINER JONES: Any objection?

MR. HALL: No objection.

EXAMINER JONES: He's so qualified.

Q. (By Mr. Bruce) Mr. Raines, again we've taken your exhibit and just stapled all the pages together, 1 through 11. If you could start with page 1, give a little overview of what you're seeking, and then go into the technical -- some of the well unit orientations, the surface locations, and why you're asking for the increased allowables in that and the relaxed setbacks.

A. Yes. The current allowable is 320 barrels a day per 40-acre unit, and a 2000-to-1 GOR.

We are asking, for the Bone Spring, for 9,600 barrels of oil a day for the 480-acre unit, which

would be equivalent to 800 barrels a day per 40. And for the Wolfcamp, we're asking for 6,000 barrels of oil a day per 480-acre unit, which would be equivalent to 500 barrels a day per 40. And for both Bone Spring and Wolfcamp, we're asking for a GOR of 5,000.

And the increased allowable is needed to develop our multiple stacked pay zones and to support our planned well density. And there's a great deal of offset production data and numerical modeling that we've done to support our development production forecast that leads to the increase in allowables we're requesting.

Q. Turn to page 2 and discuss what that shows.

A. Sure. Page 2 shows the configuration of our Bell Lake North and South units, along with all of the offset production data. Both North and South units are three-mile-by-three-mile square units.

There's a great deal of production shown in the maps surrounding Bell Lake. All of that offset production has been utilized, along with detailed geologic and engineering evaluations, to optimize our development for well spacing for lateral length for directional orientation. And I'll review some of that information on the following pages.

Q. In looking at this page 2, the vast majority of the wells out here have been one-mile laterals, correct?

A. That's correct.

Q. Except just immediately to the west of the South Unit, they've all been pretty much stand-up well units?

A. That's correct. Some of the early wells drilled in this area in Southern Lea County were east/west-oriented laterals, and the industry pretty quickly figured out that stand-ups that are north/south-oriented laterals were better wells.

Q. And let's go on to your Development Plan, page 3.

A. Page 3 shows the North Bell Lake Unit. The three-mile-by-three-mile configuration allows us to set up in the center with a corridor, with an infrastructure corridor, with our pads, roads, pipelines and power lines. This minimizes our surface impacts and also creates more efficient capital deployment because it's less expensive, since we're centralizing everything.

Chris Miller earlier testified about our mile-and-a-half laterals, and I think this graphic depicts that. It allows us to set up in the center and drill mile-and-a-half laterals to the north and to the south.

Q. Go ahead. On to page 4.

A. Sure. Page 4 illustrates our multiple stacked

pay zones. In the Bell Lake/Bone Spring pool, we have over 3,000 feet of gross interval, with four discrete development zones that were initially going to target the upper and lower Avalon and the second and third Bone Spring. We've done a great deal of technical work that suggests that six wells per one-mile-wide drainage area is the most efficient.

The Bone Spring is over 1,700 gross feet, with two discrete development zones that we've identified, the Wolfcamp A and B. Technical work also suggests that six wells across a one-mile wide drainage area is also optical for the Wolfcamp.

Q. And could you discuss the offset production? I refer you to page 5.

A. Yes. The next few pages really lay out the technical work that we've done to develop a production forecast to support our allowable request. It starts here with page 5, with the offset production review.

On the left-hand side is a map showing all of the offset wells around North and South Bell Lake. It's a bubble map, with the size of the bubbles relative to our estimate of ultimate recovery for each well. Each bubble is colored to represent the completion zone. Green is the Bone Spring wells, red colors are Wolfcamp completions.

On the right-hand side are six graphs illustrating all the production data. Graph Number 1, in the upper left-hand corner, shows the well count added by year, wells drilled and completed added by year. It starts in 2011 with 68 wells. It reaches a peak in 2014 and '15 at about 270 wells added for the year, and then it begins to decrease. In 2017, this is for the first three months only. So we think the final well count in '17 will be about 200 wells added.

Graphs 3 and 4 in the center illustrate the average oil and gas rates for wells added in that year. It shows an increasing trend. If you'll look at Graph 3, in 2012, the average well came on at 305 barrels of oil a day. That rate doubled by 2014 to almost 600 barrels a day. It doubled again in 2017. So the current wells coming on production this year have averaged over 1,200 barrels a day. We think that trend is going to continue. We expect, in 2018 and '19, averages of 1,400 and 1,600 barrels a day per well. Those numbers are important because we've utilized them in our production forecast.

The main reason why the well performance is increasing is because people are drilling longer laterals, which is shown in Graph 6, with a moderate increase in lateral length over time.

But the biggest change is shown in Graph 5, where operators are completing wells with larger and larger fracs. You can see in 2011 about 500 pounds per foot is the average profit concentration. That doubled by 2014, and it's doubled again in 2017, with the average profit concentration well over 2,000 pounds a foot.

Q. When you're looking at Graph 2, you're shown the higher GOR the longer the production. That's just a natural increase, isn't it? Nothing special about it?

A. Nothing special about it. It's a natural increase. I wanted to include this to show that this is a cumulative GOR for wells that were put on production as of the dates shown there. So wells that have been on production since 2011 have a cumulative GOR today of over 5,000 wells that have not produced as long and have a cumulative GOR of less than that, as the graph shows.

Q. So there wouldn't be an undue of waste of reservoir energy by approving a higher GOR?

A. That's correct.

Q. One other thing. When you're looking at Graph 6, as you pointed out, most of the laterals are roughly one mile long, but people are drilling longer laterals.

Does the optimal size of a lateral depend on a number of things, including geology and operational

feasibility?

A. Yes, sir. It depends on geology, it depends on how efficient an operator can drill that lateral, how cheaply they can drill it, and it also depends on the capital required to support whatever lateral length it should choose.

Often, longer lateral lengths will require surface operations to be set up differently. And that's one of the reasons why, for our Bell Lake Unit, mile-and-a-half laterals are most economic, because it requires us to deploy less capital because we can centralize all those facilities.

Q. And let's go into your simulation work. Turn to page 6, please.

A. Pages 6 and 7 detail all the reservoir simulation work that we have done to support our conclusion of optimal number of wells required and also to develop production forecasts to use.

We've set up a simulation over an initial area of one and a half miles by one mile drainage area, or 960 acres. We drill mile-and-a-half laterals, with the 7,500 foot completed interval 40-stage fracs, 200 pounds per foot profit concentration. We identify the permeability in the fractures, in the fractured web area, in the reservoir, and also define the frac half

length.

What the results show is as you add more wells, the overall oil recovery is greater. If you'll look at the table, the bottom of the page, four wells results in about 3.5 million barrels recovery. That overall recovery continues to increase as we increase well count all the way up to eight wells, where the total recovery is over 4.4 million barrels.

The maps on the right-hand side depict the pressure relationship across the reservoir at the end of the simulation run.

In the four-well case, you can see the blue area between the well spacing, which indicates not much drainage between the wells. Five, six and eight cases show an increase in the efficiency of the drainage between those wells.

Q. And what does page 7 then reflect?

A. Page 7 shows a series of production plots for each of the simulation cases. Plots 1 and 2, oil and gas rates per day; Plots 3 and 4 showing cumulative oil and cumulative gas; Plots 5 and 6 showing the evolution of GOR versus time and pressure versus time.

The tables on the left-hand side, the first table shows those same results, indicating that the overall recovery increases as the well count increases.

The second table focuses in on the results per well, which shows that as the well count increases, the average recovery per well decreases.

Q. So it's kind of a balancing act, all of those different factors?

A. It's a balancing act, and we tie it together on the next page when we go over the economics.

Q. Why don't you do that?

A. Page 8 shows, in the first graph in the upper left, those same results, with the red line showing how the recovery increases as the well count increases. The blue line shows that the per-well recovery decreases as the well count increases. And the graph in the lower right-hand side shows the economics of those cases.

We have combined the production forecast from the simulation with capital necessary to drill and complete the wells and to build the production facilities.

The red line shows that the incremental discounted rate of return decreases as the well count increases, and that's because the average recovery per well is going down, but the same amount of capital per well is required as the well count increases.

The blue line shows the net present value relationship. It increases from four wells to five, it

increases from five to six, but it decreases from six to eight because the incremental production for those final two wells won't pay for the capital deployment. So we conclude that the optimal well count six wells.

Q. And what does page 9 show?

A. Page 9 shows how we have developed production forecasts that lead to our request for allowables increase. This production forecast is for the Bone Spring Unit. It's for our 480-acre spacing unit.

In this production forecast, we have developed all four intervals: The second Bone, the third Bone, the lower and upper Avalon. The wells are brought on production on average based on a 30-day drilling complete time.

We're drilling them and completing them in batches of three and then putting them on production. So the first three wells come on at day 1; the next three, day 90; the next three, day 180; and the final three at day 270.

The graph shows how that production forecast builds and reaches a peak at 9,228 barrels of oil a day, about 34 million cubic feet of gas a day, and the GOR peaks at about 4,900 standard cubic feet per barrel.

The 9,200-barrels-a-day oil production

would be an average of 770 barrels of oil per 40. We're asking for 800 barrels of oil a day per 40, equivalent to the 9,600 barrels of oil a day for the 480, and we're asking for a 5,000 to 1 GOR.

Q. And then what about the Wolfcamp? And I refer you to page 10.

A. Page 10 shows the development of our production forecast for the Wolfcamp Unit. It was developed in a similar fashion. It's for the 480-acre spacing unit. We've got six wells, three in the Wolfcamp A, three in the Wolfcamp B, that are being brought on, as the previous page did, an average of 30 days to drill and complete each one.

The graph on the left-hand side shows that the oil rate peaks at about 5,780 barrels a day. We're asking for a 6,000 barrels-of-oil per day allowable for our 480. And the GOR peaks at a little over 4,700 standard cubic feet per barrel, and we're asking for 5,000.

Q. Could you summarize your testimony, Mr. Raines?

A. Yes. Page 11 shows the summary. We have multiple landing zones in the Bone Spring and the Wolfcamp. We've done a lot of technical work to assess various development schemes. We believe that the optimum economic recovery occurs at six wells per

one-mile drainage area.

In order to accommodate this well count for this number of completions, we're requesting the allowables of 9,600 barrels a day for Bone Spring, 6,000 for the Wolfcamp, and a 5,000 to 1 GOR for both.

Q. And based on the number of wells you see being drilled here and all the offset development, which contains a lot of information, do you think these allowable figures are fair and reasonable?

A. Yes, I do.

Q. Once again, because you're looking at multiple wells, any well unit, does Kaiser-Francis need the setback relief so that it can place wells as necessary in a well unit or in a participating area?

A. Yes.

Q. Was Exhibit 7 prepared by you or under your supervision?

A. Yes.

Q. And in your opinion, is the granting of these applications in the interest of conservation and the prevention of waste?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibit 7.

MR. HALL: No objection.

EXAMINER JONES: Exhibit 7 is admitted.

MR. HALL: I have no questions.

EXAMINER JONES: I appreciate you doing all this work. It's wonderful what you did. It kind of coincides with some of the work that Devon had done in some of their hearings they shared with us.

Mr. Bruce actually, I think, presented them. But they estimated the six-well density per section as best economically -- you know, they also -- you input into your model for your wells, you took a production forecast that you got from offset wells and then backed into some reservoir perimeters and then put it in your model. Is that what you did?

THE WITNESS: That's one method that we used, yes. Another method we used to try to verify those numbers is based on our South Bell Lake 263 H well that has just recently come on production. We did a DFIT test on that well before we did the completion.

Now that we've done the frac job, we also have some additional permeability calculations that we can do from the pressures and rates from the pumping of those frac jobs. And now we've got almost 90 days of production on that well, and we have a decline that we use to fit back into the model to try to make sure that our perm numbers that we're using are valid.

EXAMINER JONES: Okay. So that well -- you're happy with that well, so far?

THE WITNESS: Very much so.

EXAMINER JONES: I can understand why nobody objected to this application. It sort of makes sense to make it into one big project area and just enable you to plan your whole thing out, instead of being limited to PAs that grow as the wells are completed and tested.

So all of this work you did, it shows the six wells. But you could also do the situation where you drill one well at one level and another well at another level 50 feet away or so, and then do a zipper frac or whatever on them? That doesn't preclude you from doing that, does it?

THE WITNESS: That's correct.

EXAMINER JONES: And your Wolfcamp, is that higher pressure out here than the Bone Spring?

THE WITNESS: A little bit, just because it's a little deeper.

EXAMINER JONES: Oh, just because it's deeper?

THE WITNESS: Yeah. We're not into the geo pressure intervals that many of the wells deeper in the basin experience in all that.

EXAMINER JONES: Okay. So it's deeper in the basin, where the Wolfcamp is higher?

THE WITNESS: Correct. We're up on a structure, and so our Wolfcamp is just a little bit above normal pressure. It's just a little over 9-pound-per-gallon grading.

EXAMINER JONES: Okay. Mr. Miller said he used 8 percent density cutoff on his porosity numbers. So you basically used his log analysis data and --

THE WITNESS: That's correct. We imported Chris's structure map and his pay isopach, and also his porosity grid into the simulation work.

EXAMINER JONES: Okay. So you've got a nice simulator in-house, or do you contract that out?

THE WITNESS: We do all the work in-house. We're using a product from Gemini Solutions. It's called Merlin. It's a PC-based application. It runs very fast, but it's a complex simulator.

EXAMINER JONES: Okay. So you can -- it's really robust? You can put in all kinds of layers and whatever complexity you want in it, it sounds like?

THE WITNESS: That's correct. The more data you have, the more complex you can make it.

EXAMINER JONES: I was going to ask you how you had time to do all of this, but I guess --

THE WITNESS: We had a team of people working on it.

EXAMINER JONES: With the amount of money -- if this is correct, the amount of money you're going to make off of this, it's worth spending some people working on it for a while.

Your profit size, is that -- your profit concentration is going up in these wells. It seems to be -- we hear that all over. People say well, more pounds of sand per foot is, you know, up to 2,000. It's getting better.

What size are you using out here?

THE WITNESS: We primarily use 30/50. It's the most commonly available and most economic.

EXAMINER JONES: Okay. We use the smaller stuff, starting out like a hundred meshes.

THE WITNESS: We use the hundred meshes of diversion control initially.

EXAMINER JONES: Okay.

THE WITNESS: And I know a lot of operators are pumping that hundred mesh for their whole job. We have a little bit different feeling about that.

EXAMINER JONES: So you tail end with some bigger stuff?

THE WITNESS: Correct.

EXAMINER JONES: And you don't get sand coming back? You don't see a lot of sand coming back?

THE WITNESS: Not very much. We do get some sand back in the initial days of the flowback, but not very much.

EXAMINER JONES: Okay. And your simulation, did it confirm about the standup wells being better, or that just an empirical thing? In other words, all of the geologic data you put in and the stress data, I guess, does that confirm that you really do need to drill wells north/south?

THE WITNESS: We haven't used a simulator to analyze that problem. What we have done is simply analyze the offset production data. There are a lot of east/west wells that were drilled early in the trend.

EXAMINER JONES: Okay.

THE WITNESS: It's a very consistent conclusion, no matter where you point the lens, that east/west wells are poorer than north/south wells by about 20 percent. And this is correct throughout the whole basin, not just in Southern Lea County.

EXAMINER JONES: Okay. And your 5,000 limiting GOR, is that what you expected going into this, or did you see some evidence of that in other -- so you're looking at that both for the Wolfcamp and the

Bone Spring?

THE WITNESS: Correct. They're similar fluid systems of the Wolfcamp, and this area has an initial GOR of just a little over 1,000. The same thing for the Bone Spring. They're both in the mid-40s, API gravity about 44 or 45, very similar fluid systems.

EXAMINER JONES: Okay.

THE WITNESS: And there are so many horizontal wells that have been on production as early as 2010 that we can use to analyze GOR increase with time. There's plenty of vertical production out here also that we can look at for that GOR evolution.

EXAMINER JONES: We've seen a lot of requests for 5,000 limiting GOR on the Bone Spring in the past. I haven't been around forever, like some of these guys have, but they've seen them. So it does need to be higher, I guess.

So you need this increased allowable for your production, but you haven't seen where producing wells at higher rates than this reservoir will damage your reservoir at all?

THE WITNESS: That's correct.

EXAMINER JONES: And that's because -- is that because it's the type of drive mechanism or the solution gas drive, or is that just well known in the

industry right now?

THE WITNESS: I don't know if it's well known or not.

EXAMINER JONES: Okay.

THE WITNESS: But the primary mechanism, in our view, related to the withdrawal rate that would cause damage isn't in the reservoir, it's in the fracture network.

EXAMINER JONES: Okay.

THE WITNESS: If you withdraw the -- if you produce at a very high rate, you have a high drawdown in that fracture network which can refluidize your sand, which causes sand flowback, which then creates a reduction in permeability in that fracture network because it's not propped open like it was.

EXAMINER JONES: Okay.

THE WITNESS: Most of the effects at that high rate are felt within the fractured area and not in the reservoir matrix itself.

EXAMINER JONES: Okay. So if you're consistent with your production, maybe it won't do that? In other words, surging your well might do some damage to it?

THE WITNESS: It might, or more importantly, during the initial flowback producing it at

too high of a rate. A more conservative withdrawal rate during the initial flowback, and then just allow the well to decline naturally.

EXAMINER JONES: Okay. So you're saying the conservative -- can you repeat that? So it might be a good thing to go do or --

THE WITNESS: Yes. The most optimal way to produce the well would be to open it up during the flowback to a conservative choke setting.

EXAMINER JONES: Okay. Watch it real closely to make sure you're not damaging --

THE WITNESS: Watch it closely.

EXAMINER JONES: -- your frac job?

THE WITNESS: If you're producing sand, cut the rate back.

EXAMINER JONES: Okay, yeah. What about initial reservoir pressure and bubble point pressure and that kind of stuff?

THE WITNESS: Out initial reservoir pressure out here in the Bone Spring is about 4,500 psi. We've taken fluid samples for our first well, and it shows a bubble point pressure of about 3,500 psi.

EXAMINER JONES: So you've actually taken some samples, downhole samples or --

THE WITNESS: We've taken surface separator

samples and recombined them in the lab.

EXAMINER JONES: Recombined the samples, okay.

Is the Wolfcamp -- you expect that to be similar in the Wolfcamp?

THE WITNESS: I expect the bubblepoint pressure to be similar to that, and the reservoir pressure will be a little bit higher because it's a little deeper. Probably around 5,000 psi reservoir pressure.

EXAMINER JONES: Okay. I think that's about it. Oh, the Devonian. How many wells are actually producing from the Devonian out here?

THE WITNESS: We have one well producing.

EXAMINER JONES: Just one well producing in 40-acre spacing; is that correct?

THE WITNESS: [Witness nods head.]

MR. BRUCE: I haven't looked out here in a long time. I know there's some 160-acre Devonian somewhere around here.

EXAMINER JONES: So that lease that's on that well is held -- we don't know if that's a federal lease or a state lease. But if this all goes through and it makes it one PA, it's going to hold every lease in here. And depending on the segregation clause for

the whole -- however much extent those leases go out beyond it, there's no hesitation on the landowner's part to -- because of that, I take it?

MR. BRUCE: You'll have to ask Ms. Courtney about that. Obviously, they've been out here for 60-something years.

EXAMINER JONES: Yeah. The notice -- I might have missed this, but can I ask Ms. Courtney a question real quickly?

Ms. Courtney, did you notice all the override owners also?

MS. COURTNEY: Yes, sir.

EXAMINER JONES: Okay.

Mr. Brooks?

MR. BROOKS: I will also ask Ms. Courtney a question, if I may, on the notice issues. Like most of my questions, you can feel free to respond to it, Mr. Bruce.

Did I understand that you noticed not only all owners in the two units, the North Unit and the South Unit and the one-mile area around that, but you also noticed the people in between who might not have owned it in the periphery of either unit?

MR. BRUCE: Well, we notified every single interest owner in each unit --

MR. BROOKS: Right.

MR. BRUCE: -- working royalty, override, NPRI, and then the operators of the existing Bone Spring or Wolfcamp wells within a mile boundary around each unit.

MR. BROOKS: Okay. So I heard you say something -- I heard one of the witnesses or you say something about notifying additional people. And I thought maybe that was in the area that's in between the two units, but not in the periphery of either one of them. That would be --

MR. BRUCE: I think I just said I needed more time to put together everything to make sure everybody received actual notice or publication notice.

MR. BROOKS: Okay. Well, very good. I will drop that subject.

I just want to clarify. Because I'm not an engineer, so I can't elaborate much on what -- getting to the intricacies of your testimony, but I think Mr. Jones did a good job of exploring that. You are drilling, you said, north/south wells, right.

THE WITNESS: Correct.

MR. BROOKS: Exclusively?

THE WITNESS: Correct.

MR. BROOKS: And you're going to -- the

upshot of your study was that three wells would be appropriate to develop a 480-acre unit?

THE WITNESS: That's correct.

MR. BROOKS: The 400-acre unit would consist of the east or west half of one section, and the adjacent quarter sections of the section to the north or to the south of that first section?

THE WITNESS: Correct.

MR. BROOKS: For instance, if you're drilling Section 12, your unit would be the east half of Section 12, and the southeast of Section 1.

If you were drilling the west half, it'd be the west half of Section 12 and the southwest quarter of Section 1, right?

THE WITNESS: Correct.

MR. BROOKS: And you'd have a separate unit for the half sections in Section 36 of the quarter sections in the north half of Section 1?

THE WITNESS: Correct.

MR. BROOKS: Okay. And in each of those, you're going to drill three horizontal wells?

THE WITNESS: In each zone, yes.

MR. BROOKS: More or less equally spaced?

THE WITNESS: Yes, sir.

MR. BROOKS: So you'll be drilling three

wells across an area the width of which is one-half section?

THE WITNESS: That's correct.

MR. BROOKS: And six across an area, the width of which is one mile?

THE WITNESS: That is correct.

MR. BROOKS: Okay. I should have said one half of the width is one-half mile of the section. Okay, I think I understand that.

And you figured that that is where the optimal production would occur?

THE WITNESS: At today's product prices and service costs, yes.

MR. BROOKS: But of course, that could change any day?

THE WITNESS: It could.

MR. BROOKS: Because it's dependent on factors other than the reservoir characteristics?

THE WITNESS: Correct.

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

MR. BRUCE: I have nothing further in these cases, and I'd ask that cases 15823 and 15824 be continued for two weeks just to confirm notice.

EXAMINER JONES: Cases 15823 and 15824 are continued till September 28th.

[Proceedings concluded at 10:34 a.m.]

STATE OF NEW MEXICO

COUNTY OF BERNALILLO

CERTIFICATE OF COURT REPORTER

I, DEBRA ANN FRIETZE, Certified Court Reporter, New Mexico Certified Court Reporter No. 251, 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.

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Certified Court Reporter
New Mexico CCR No. 251
Date of CCR Expiration: 12/31/2017