STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

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

CASE NOS. 14125 & 14126

APPLICATION OF APACHE CORPORATION FOR STATUTORY UNITIZATION, LEA COUNTY, NEW MEXICO

and

APPLICATION OF APACHE CORPORATION FOR APPROVAL OF A WATERFLOOD PROJECT AND TO QUALIFY THE PROJECT FOR THE RECOVERED OIL TAX RATE, LEA COUNTY, NEW MEXICO

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Legal Examiner
TERRY G. WARNELL, Technical Examiner
RICHARD EZEANYIM, Technical Examiner

May 15, 2008

Santa Fe, New Mexico

This matter came for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Legal Examiner, TERRY G. WARNELL, Technical Examiner, and RICHARD EZEANYIM, Technical Examiner, on May 15, 2008, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: JOYCE D. CALVERT, P-03
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APPEARANCES

FOR THE APPLICANT:

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MR. WARNELL: Okay. Let's go back on record.

Our next case is Case No. 14125, Application of Apache Corporation for Statutory Unitization, Lea County, New Mexico. And we're also going to consolidate the next case, Case No. 14126, Application for Apache Corporation for Approval of Waterflood Project and to Qualify the Project for the Recovered Oil Tax Rate, Lea County, New Mexico.

Mr. Bruce, call for appearances?

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

MR. WARNELL: Will the witnesses please rise and identify themselves?

MR. MORENO: Mario Moreno, with Apache Corporation, landman.

MR. CURTIS: Bob Curtis, geologist.

MR. MAYES: Kevin Mayes, petroleum engineer.

[Witnesses sworn.]

MR. BRUCE: Mr. Examiner, before I begin, especially on the land end, there's a lot of paperwork to go through, so if something -- if we go through it too fast and something strikes you and you want to ask a question, feel free to interject at that time rather than waiting until the end.

MARIO MORENO

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. Mario Moreno. I live in Tulsa, Oklahoma.

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

A. I work for Apache Corporation as a senior land advisor.

Q. Have you previously testified before the commission as a landman?

A. Yes, I have.

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

A. Yes, they were.

Q. And are you familiar with the -- does your area of responsibility at Apache cover this portion of Southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the land matters involved in this application?

A. Yes, I am.

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

MR. WARNELL: We will accept Mr. Moreno as being so qualified.

Q. (By Mr. Bruce): First, Mr. Moreno, could you briefly summarize what Apache seeks in these cases?

A. In Case 14125, Apache seeks to statutorily unitize all interest in the Blinebry, Tubb, and the Drinkard formations underlying the 2480 acres of state, federal and fee lands for our proposed West Blinebry Drinkard Unit.

Also, in Case 14126, Apache is also seeking approval of the waterflood project and also certification of the project for the recovered oil tax rate.

Q. What is the proposed unitized interval?

A. The proposed unitized interval includes all depths between 8.75 feet above the stratographic Blinebry marker down to the top of the Abo Formation as found on the type log for the Hawk B-134 well, which is located 1040 feet from the south line and 1470 feet from the west line of Section 9, Township 21 South, Range 37 East.

Q. And that definition is in the unit agreement, is it not?

A. Yes, it is. And also the unitized formation will also include the subsurface points throughout the area, correlative to these depths.

MR. EZEANYIM: Could you state your vertical limits? Could you tell me about the vertical limits?

THE WITNESS: My what?

MR. EZEANYIM: Your vertical limits. Have you --

MR. BRUCE: Mr. Examiner, if we could, the easiest thing would be to wait for the next couple of exhibits, and then we could specify that for you.

MR. EZEANYIM: Okay.

Q. (By Mr. Bruce): Mr. Moreno, could you identify Exhibit 1, and describe its contents for the Examiner?

A. Okay. Exhibit 1 is a land plat which outlines the proposed unit area and identifies the separate tracts which comprise the unit area. Also attached to the Exhibit 1 is a legal description of all the tracts, or all the lands, in the entire unit area. This plat also describes 14 tracts in the unit. Apache operates 12. Campbell and Hendrick operates one, and Chevron operates another one.

Q. Okay. Let's move on to your Exhibit 2. Would you identify that for the Examiner?

A. Yes. Exhibit 2 is our Proposed Unit Agreement, and it is the standard form used by the State Land Office and the BLM, and it's similar to the agreements approved previously by the Division.

This unit agreement also describes the unit area and the unitized formation. And also the unitized substances include all the oil and gas produced from the unitized formation. This unit agreement also designates Apache Corporation as the unit operator.

Q. Let's stop for a minute and refer back to

Examiner Ezeanyim's question. Could you move on to Exhibit -- excuse me -- Page 5 of Exhibit 2.

And does Subparagraph (v) define the unitized formation?

A. Okay.

Q. Does Exhibit -- Paragraph (v)?

A. Yes. It does define a unitized formation.

Q. And so you described that previously. And will the next witness, the geologist, have a portion of a type log which will show the unitized formation?

A. That's correct.

Q. What is Exhibit 3, Mr. Moreno?

A. Exhibit 3 is our Proposed Unit Operating Agreement, which basically sets forth the authorities and the duties of the unit operator, as well as the apportionment of the unit expenses between the working interest owners.

Q. And does the Unit Operating Agreement contain a provision for carrying working interest owners?

A. Yes, it does. It's in Article 11.

Q. Now, often these agreements provide for a penalty against nonconsenting working interest owners. Does this agreement contain such a provision?

A. No, it does not.

Q. And this will come up later. But Apache has other units in the immediate area, does it not?

A. Yes, it does.

Q. And those agreements do not contain penalty provisions, either?

A. No, they do not. Except, well --

Q. EBDU does, but not --

A. EBDU does, but not the NEDU, no.

Q. Let's discuss the ownership of tracts within the unit area --

A. Okay.

Q. -- and maybe I'll refer you back to Exhibit 2, the unit agreement, Mr. Moreno.

Would you describe how you determined the tracts and the names of the working and royalty interest owners in the unit area?

A. Okay. The unit tracts are formed according to common mineral ownership. And if you'll go back to the unit agreement and look at Exhibit 2, which would be the -- would be Exhibit B-1 to the unit agreement.

Q. And that's a 27-page exhibit to the unit agreement?

A. That is correct. And this Exhibit B-1, basically, you'll find that it lists a tract by tract listing of all the interest owners. And these names and the interests were obtained from current Division orders and title opinions.

Q. Are all of the tracts within the proposed unit

area producing?

A. Yes, they were. And all of these tracts also have Division orders covering them.

Q. And so all of the data within the unit agreement should be current and correct?

A. Yes.

Q. Unless perhaps somebody has a changed address and hasn't notified Apache?

A. That is correct.

Q. How many interest owners are there in the proposed unit area?

A. We've got 10 working interest owners, 150 royalty, 88 overriding royalty interest owners.

Q. Okay. Now, let's first talk about the working interest owners. Referring to Exhibit 4, who are they, and who do you seek to statutorily unitize?

A. If you'll look at Exhibit 4, Exhibit 4 lists all of the working interest owners, the then working interest owners that we currently have within the boundaries of our unit. Every one of our working interest owners have ratified the agreement except for Geodyne Nominee Corporation, John P. Searls, and Susan Searls Collier. And we are seeking to unitize these three working interest owners.

Q. What is the total percentage of working interest owners who have voluntarily ratified the unit?

A. 99.4 percent.

Q. Now, let's move on to the royalty and the overriding royalty owners. In Exhibits 5 and 6, what do those two exhibits reflect?

A. Well, if you'll note on Exhibit 5, this lists all of the royalty interest owners and gives you a breakdown of what their tract royalty interest is and their unit royalty interest would be.

Exhibit 6 lists all of the overriding royalty interest owners and also breaks down their unit, gross royalty and unit royalty interest.

Q. Now, in looking at Exhibits 5 and 6, they're framed in identical matters. And looking over to Column 3, Mr. Moreno, what does Column 3 of those exhibits indicate?

A. Column 3 indicates whether the royalty and/or overriding royalty interest owner on each one of the exhibits has ratified the unit agreement.

Q. And so by looking at these two exhibits, you would seek to statutorily unitize any royalty or overriding royalty interest owner who doesn't have an X in Column 3 across from his name?

A. That is correct.

Q. And rather than trying to identify them on those exhibits, does Exhibit 6A list all of the owners who have the private or fee owners who have not yet ratified?

A. That is correct.

Q. What is Exhibit 7A?

A. Exhibit 7A contains ratifications from all the overriding royalty and royalty interest owners who have ratified the unit to date.

Q. Okay. And what about Exhibit 7B?

A. 7B is a -- contains all the copies of the ratifications for the working interest owners who have ratified the unit and unit operating agreement to date.

Q. And you mentioned there's state and federal land in the unit. Has the Commission of Public Lands preliminarily approved unitization?

A. Yes, they have.

Q. And what is Exhibit 8?

A. Exhibit 8 is a letter from the State of New Mexico, Commissioner of Public Lands, which has given us preliminary approval to move forward with our proposed waterflood unit.

Q. Okay. They will not grant final approval until the Division's order is entered; is that correct?

A. That is correct.

Q. What is Exhibit 9? BLM

A. Exhibit 9 is the letter from the Bureau of Land Management who has also given their preliminary approval to move forward with our waterflood project.

Q. What is the total percentage of royalty plus overriding royalty owners who have voluntarily ratified the unit?

A. To date, including the BLM and the State Land Office, we've received 92.8 percent of the royalty and overriding interest owners who have ratified the unit agreement.

Q. And so both looking at working interest owners and then the royalty owner group, the voluntary ratification exceeds the 5 percent required by statute?

A. Yes, it does.

Q. And if interest owners signed ratifications after the hearing, will they have been deemed to have ratified or consented to the unit?

A. Yes.

Q. There's so many owners. Do you continue to get -- do the ratifications continue to dribble in?

A. Yes, they do.

Q. Now, let's discuss your efforts to obtain the voluntary unitization of the parties to the unit. Would you please identify Exhibit 10A and 10B?

A. The Exhibit 10A, basically, is the copies of all the correspondence sent to the royalty and overriding royalty interest owners in the unit. Exhibit 10B is copies of all correspondence sent to the working interest owners proposing

the unit.

Q. Okay. Rather than just go through the documents, the correspondence letter by letter, could you, for the Examiner, outline Apache's contacts with the interest owners?

A. In October of 2005, we first began considering unitization, and we started having informal discussions with the working interest owners within our proposed 2480-acre boundary unit.

Our meetings -- primarily, we focused with Chevron and BP since they were the larger working interest owners. Then December 5th of 2005, we had our first informal meeting with BP and Chevron where we began -- where we started to begin collecting data to formulate our tract participation.

Subsequent to that date -- we had meetings three times after that in 2007, also with BP and Chevron. And then started having -- once we knew BP and Chevron were coming on board with us to form this unit, then we started having meetings at the end of December, 2007, with the smaller working interest owners, primarily being Campbell and Hendrick.

Then on February 18th -- which there's a letter in the correspondence that was Exhibit 10B, I believe -- that went out on the working interest owners where we sent our final unit and unit operating agreement forms, which basically identified the proposed boundary and also our proposed participation formula.

And subsequent to that date, on March 4th, 2008, we sent our first mail-out to all the royalty and overriding royalty interest owners along with ratifications in the unit agreement. Then on April 11th, we sent our last mail-out to the royalty and overriding royalty interest owners that had not ratified the unit from the first mail-out just to advise them that the hearing is coming up, and we'd like to get their ratifications in as soon as possible.

Q. Have you received any formal objections to the unitization?

A. No.

Q. Just people who haven't returned their ratifications?

A. That is correct.

Q. In your opinion, has Apache made a good faith effort to secure voluntary unitization?

A. Yes, we have.

Q. And was written notice of the unitization hearing given to all of the owners who did not voluntarily join in the unit?

A. Yes.

Q. And what is Exhibit 11?

A. Exhibit 11 is an Affidavit of Notice regarding a notice sent to the royalty and overriding royalty interest owners.

Q. Were any of the letters returned?

A. Yes. And those persons are listed on Exhibit 12.

Q. Okay. Exhibit 12 is a listing of people who either didn't pick up their certified mail, or it was returned as undeliverable, correct?

A. As undeliverable, that is correct.

Q. Except for Bishop Whipple Schools. Were you ever able to determine an address for that entity?

A. I believe we were able to find an address for them.

Q. But there was never any response?

A. No.

MR. BRUCE: Mr. Examiner, if you'll go toward the back of Exhibit 11, as I mentioned to you before the hearing, we will need to continue this matter for a couple of weeks. Although many of these certified mails were delivered, the post office hasn't seen fit to return the green cards to me. So I will probably need to continue both hearings to submit some additional green cards, et cetera, at the next hearing.

What you see on a lot of these is information from -- you can get information from the postal service's website, but it's not the actual physical green card, so --

Q. (By Mr. Bruce): Now, you previously noted that the addresses are from the Division order files; is that correct?

A. Yes, that's correct. And so all of the addresses should have been current.

Q. Now, where you knew -- or when you did your mailings, some of the letters were returned, were they not?

A. Yes, they were. But there was still some of the ones that were returned that we attempted to try to find, but they were still unlocatable.

Q. Okay. So you examined pertinent records, whether county records or telephone records, to update the addresses when the correspondence was returned?

A. Yes, that is correct.

Q. Now, with respect to the bad addresses or unlocatable owners, was notice published as to them?

A. Yes, it was. And those notices are marked as Exhibit 13.

MR. BRUCE: Mr. Examiner, there was one or two other names that I forgot off of this, and I published notice of this hearing, but I haven't gotten the Affidavit of Publication back. I'll be submitting that at the next hearing also.

Q. Were all of the unsigned working interest owners notified of the hearing?

A. Yes, they were. Copies of the notice and the certified receipts are attached to the Affidavit of Notice submitted as Exhibit 14.

Q. And all of the working interest owners were

locatable, were they not?

A. Yes, they were.

Q. Now, the next witnesses will discuss the waterflood project. And for the waterflood, Apache had to notify offsets and surface interest owners; is that correct?

A. That is correct.

Q. What does Exhibit 15 reflect?

A. Exhibit 15 is a plat showing the offset operators and the lessees in the Blinebry, Tubb, and Drinkard Formations within one-half mile of our proposed injection wells to the unit.

Q. And in the upper left-hand corner of this exhibit, is there a color scheme to show who the operators are?

A. Yes, sir, there is.

Q. And what is Exhibit 16?

A. Exhibit 16 identifies the surface owners in the unit area.

Q. And for purposes of the injection, does notice have to be given to the surface owners where the injection wells are located?

A. That is correct.

Q. And up there in the upper left-hand side, the surface owners are designated by a color scheme?

A. By color scheme, that is correct.

Q. Now, you have all surface owners, but as to

Robert McCassland and Charlie Bettis, there are no injection wells at this point on their --

A. That is correct.

Q. And so they did not need to be given notice?

A. That is correct.

Q. And what is Exhibit 17?

A. Exhibit 17 is an Affidavit of Notice regarding a letter sent to the surface owners and offset operators pertaining to Apache's application to institute a waterflood project. And this letter also contains the certified copies and returned receipts.

Q. Mr. Moreno, in your opinion, will the granting of these two applications be in the interest of conservation and the prevention of waste?

A. Yes.

Q. And were Exhibits 1 through 17 prepared by you or under your direction or compiled from company business records?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, I move the admission of Apache Exhibits 1 through 17.

MR. WARNELL: Exhibits 1 through 17 are so admitted.

MR. BRUCE: I have no further questions of the witness.

MR. WARNELL: Questions?

MR. BROOKS: No questions.

EXAMINATION

BY MR. EZEANYIM:

Q. Mr. Moreno?

A. Yes, sir.

Q. Is that correct?

A. Yes, sir.

Q. You said you only have three working interest owners or royalty interest or --

A. We have three working interest owners left that have not ratified the unit, and we seek to get them unitized.

Q. Very good. Okay. Do you know why -- have you contacted them? And just considering whether to --

A. Yes. I have talked with them numerous times. Two of the owners that we seek to unitize are kind of in a family squabble, or squabbling over the interest. So one of those family members has ratified because she was content with the interest we indicated on our unit agreement, because we took it off of the title opinion.

However, her sister does not agree with it, so there's a lot of discussions going back and forth with those three family members.

Q. So in your opinion, it's not because of the unit operating agreement that they don't agree.

A. No. As a matter of fact, one of the owners I've been communicating with has indicated that they are in. They

will ratify this agreement. However, they got to get this issue with the family owner interest issue resolved, which they may or they may not.

Q. Okay. I'm trying to get at something, and that is, you know, you need to come to an agreement. You need an operating agreement, but other than that, you have to have your allocation of costs and production and the initial credits and charges to make sure they are fair, reasonable, and equitable.

So after that, nobody has objected to this unitization because of those.

A. No, they have not.

Q. Okay. The BLM and the State Land Office has given permission --

A. Yes.

Q. -- for both the unit and the --

A. Yes, sir. Yes, sir.

Q. And did you say you're not seeking for nonparticipation penalties?

A. That is correct. We're not seeking for a penalty.

Q. Very good.

A. Well, we're not seeking for a penalty under our unit operating agreement. However, I believe the Commission allows for cost plus 200 for unitization; is that correct?

MR. BRUCE: Yeah. But we're not seeking that.

Q. (By Mr. Ezeanyim): Yeah. Okay. That's fine. And the participation is formalized in the unit operating agreement?

A. It is in the unit agreement.

Q. Units agreement.

A. Right.

MR. BRUCE: One of our witnesses will discuss that more, Mr. Ezeanyim.

MR. EZEANYIM: Okay. You may be excused. Thank you.

MR. WARNELL: Will the witness please step down if there are no more questions?

Thank you, Mr. Bruce.

ROBERT E. CURTIS

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Will you please state your name.

A. Robert E. Curtis.

Q. Where do you reside?

A. Tulsa, Oklahoma.

Q. Who do you work for?

A. I work for Apache Corporation as a senior staff geologist.

Q. Have you previously testified before the

Division?

A. Yes.

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

A. Yes.

Q. And are you familiar with the geology involved in this application?

A. Yes.

Q. And this area, this township is your responsibility at Apache; is it not?

A. Yes, it is.

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

MR. WARNELL: So be it.

Q. (By Mr. Bruce): Mr. Curtis, could you identify Exhibit 18 for the Examiner, and discuss the zone Apache seeks to unitize in this case.

A. Exhibit 18 is a west/east-oriented structural cross section that goes through the approximate north/south middle of our proposed unit, which we will see on a later exhibit.

There are seven wells shown. Each is identified with the operator, the lease name, well number, and then its location information. The type log that Mr. Moreno mentioned that we used in the unit agreement is the Hawk B-1 #34. It is

API 30 025 36344

identified as the type log.

The units we are seeking to unitize is the entire Blinebry, Tubb, and Drinkard reservoirs. As described in the agreement, that reservoir extends from a 75 feet above the Blinebry marker, which we have identified as the Blinebry -- BLBY OCD -- top marker, and this well is at a drill depth of 5584 feet down through the Drinkard Formation, the base of which is in the top subadjacent Abo, being in this well at 6690 feet.

Q. Insofar as the Blinebry, you've got Blinebry marker and Blinebry OCD. Those depths have been previously identified by the Oil Conservation Division, have they not?

A. Yes, yes.

Q. So there's something -- those are depths -- those are markers that can be found in the Division's records?

A. Yes. When the Blinebry pool was created, the Division defined the Blinebry reservoir interval as extending 75 feet above the described Blinebry markers.

Q. Now, in looking, you've got these color codes again, but what does the green indicate?

A. For purposes of waterflooding, we will inject water into the two darker green bands. The uppermost is what we have -- what we call the Blinebry oil lag. The lower interval is the Drinkard. We've inherited some rather -- as it turns out, some unfortunate terminology from Shell who did the

initial unitizations and pool definitions in the area. The red-dashed line, which is labeled Blinebry Gas Oil, is at a subsea depth of 2255 feet. In '87, when they formed the units North Blinebry Drinkard pool, they said this was a gas cap.

In 1990, when they re-approached or re -- had to come back to the OCD to make the pool rules effective and permanent, they had determined at that time the gas cap had been eliminated and was no longer extant, at least as far as the northeast Drinkard unit goes, which is adjacent to our east.

Additionally, in the last four years, Apache has drilled and completed over 40 Blinebry, Tubb, and Drinkard wells in this unit, recommended unit area. None of which have been completed as gas wells. So we strongly suspect there is no longer a gas cap, but to be conservative and prevent potential problems, we will not be injecting water into that.

Q. Now, let me ask you one thing: Normally, Southeast New Mexico, the Blinebry, Tubb, and Drinkard form separate pools, do they not?

A. Yes, they are carried as separate pools.

Q. But what about the acreage within the boundary of the proposed unit? Are they separate pools?

A. Not anymore. In April of 2006, Apache approached the OCD to have the units north of Blinebry, Tubb, Drinkard pool extended, both to the east to cover our East Blinebry Drinkard pool, which was in the process of being unitized, and

also to the west to cover the area that is -- that we are now seeking to have formed as the West Blinebry Drinkard pool.

Q. So according to the Division, this entire unitized interval is one single pool?

A. Is one single pool.

Q. Okay. Now, let's discuss the production in the zone to be unitized. What is Exhibit 19?

A. Exhibit 19 is a well data and lease data exhibit. The lease names are so identified in rather bold font, although in some cases they're covered up by other materials. State leases are shown in the various shades of red. Federal leases are shown in various shades of blue, and fee leases are shown in various shades of yellow.

Each well is identified by its operator, lease name, and well number. The colored attributes or donuts, if you will, around each well bore indicate which formation or formations have been perforated -- yellow being Blinebry; red being Tubb; blue being Drinkard. There's only two wells on the map that I am aware of that have perforated any of those three formations and not produced them, one of which would be -- and there is a database error or change.

In Section 5, the well identified as the Gruy Petroleum Management Curry No. 1, at some point in time, Cimarex Operating bought that well, so it should be called Cimarex. We have made that correction in some other exhibits.

Although they perforated the Blinebry, they did not produce it. And it is now producing in the Eumont Yates-Seven Rivers pool.

Also down in the unit D of Section 17, Chevron drilled its Mittie Weatherly No. 7 down through the Drinkard. However, it did not perforate nor test the Blinebry, the Tubb, nor the Drinkard, and it is currently a Grayburg, Penrose Kelly Grayburg well.

Q. Okay. What is Exhibit 20?

A. Exhibit 20 is a structure map on the top of the Tubb Formation. The Tubb is the most reliable, or has been the most reliable marker within the unit, especially considering the number of old electric logs we have to use. It has the same perforation attributes. The contour interval is 20 feet, ranging from the highest contour lines being in the warm red and yellow colors down to the lowest being the cooler blues and purples.

Q. Now, when you're looking at defining why you decided on the unit boundaries, could you go into, from a geological standpoint and maybe actually a little bit of a land standpoint, why you decided on these boundaries?

A. Well, as far as the structure goes, the effective porosity and permeability decreases as one goes down dip. At a depth of minus 2740 to minus 2760, wells have had their productive potential severely curtailed by diagenesis, plugging of porosity, permeability. And as I mentioned, the Curry No. 1

in the southern part of the Section 5 in the northwest corner of the map did perforate the Blinebry but was not found to be productive. The western boundary we'll discuss with the porosity maps.

Q. Okay. And what is on the eastern boundary?

A. We're bounded adjacent to the east by our -- by the Apache-operated Northeast Drinkard Unit.

Q. Okay. Let's move on to the isopachs, the first one. What is Exhibit 21?

A. The first one, Exhibit 21, is a net pay isopach of the Blinebry Oil leg, which, if you remember from Exhibit 18, the cross section is the bright green band up at the top. Once again, I've colored-coded the isopach contour interval values to make it easier to see.

The large number to the left of the various well bores is the number of feet of pay I've calculated. To do this map, I used only modern gamma ray and neutron density logs from which I could calculate cross plot porosity. We found that using some of the old vintage logs, the porosity values just bounce all over the place, and one ends up creating a map that looks like an isopach of random variables.

Looking at the gray-shaded area, which the zero line would be on the outside edge of that on the west side of the map, approximately along the west unit boundary, the Blinebry Pay is severely reduced. In fact, one sees it going fairly far

eastward over into Section 17. So we set the western unit boundary along the Apache lease lines over there.

And Chevron has, of course, been involved in ratifying the unit and discussing various parameters of the unit, and they have had no objection to this proposed unit boundary line, nor have they asked for any of their acreage over there to be included.

Q. Same thing with Campbell and Hendrick?

A. Same thing with Campbell and Hendrick to the south. Also, I probably should add that there's a lot of older wells that do not have modern electric logs in them. I extended the contours over those areas by form lining my pay values of the Blinebry cumulative production map. This is a technique we have been using for four to five years, and we've been very pleased with our well performance from new wells drilled based upon this method.

Q. Okay. What does Exhibit 22 reflect?

A. Exhibit 22 is a similar net pay map on the Drinkard. This will be the lower of the two bright green bands. Pay criteria are the same as they were in the Blinebry. It's a little bit better than one sees in the Blinebry. But again, over on the western side of the boundary, net pay values are decreased as also were accumulative production values. So once again, the western boundary was set along the Apache lease lines and also based upon the net pay isopach and also the

accumulative production values.

Q. Okay. Now, your last two maps showed a reservoir to the south on the Stephens and Johnson piece. Why weren't they included in there?

A. Mr. Stephens and Johnson, they declined participation.

Q. They asked to be left out?

A. They asked to be left out, so we did, in fact, leave them out to conform to their wishes.

Q. From a geologic standpoint, has this reservoir been reasonably defined by development?

A. Yes.

Q. And is the Blinebry, Tubb, and Drinkard Reservoir continuous across the unit area?

A. It's continuous across the unit area. In fact, it's continuous across the entire central basin platform in the southern and eastern part of Lea County.

Q. Referring to Exhibit 23, geologically, is this reservoir a good candidate for waterflooding?

A. Yes, it is a good candidate. In fact, the immediate areas we see on Exhibit 23, it will be the fourth unit in waterflood involving all or parts of the Blinebry, Tubb, and Drinkard Formations.

Q. And the fourth or fifth?

A. If I said fourth, it was a misstatement. It

should be fifth.

Q. Fifth. Are there -- is there a freshwater zone in this area, Mr. Curtis?

A. Yes. We spoke to Ken Fresquez with the State Engineer's Office in Roswell. The Ogallala Aquifer, according to their records, should extend to a depth of about 130 feet. There is some debate about the Santa Rosa Formation whose top is at 950 feet. And in parts of the county, it can be a freshwater source. However, in the 21 South, 37 West area, it appears to be highly mineralized and is, therefore, not freshwater.

Regardless what depth, however, the freshwater extends to, every well within the proposed unit boundary has at least two strings of casing set through both intervals, one of which has cement cemented back to the surface. So groundwater should be adequately protected.

Q. Are there any faults in this area which would connect the injection zone to a freshwater zone?

A. No.

Q. Were Exhibits 18 through 23 prepared by you or under your direction?

A. Yes.

Q. And in your opinion, is the granting of this application in the interests of conservation and prevention of waste?

A. Yes.

MR. BRUCE: Mr. Examiner, I tender the admission of Exhibits 18 through 23.

MR. WARNELL: We accept Exhibits 18 through 23.

MR. BRUCE: I have no further questions of the witness.

MR. WARNELL: Any questions, Mr. Brooks?

MR. BROOKS: No questions. Thank you.

MR. EZEANYIM: Let me reserve my questions until we have the engineer.

MR. BRUCE: Okay.

EXAMINATION

BY MR. WARNELL:

Q. All right, sir. I had two questions here. If we could go back to Exhibit 18.

A. Yes, sir.

Q. Mr. Curtis, explain the two shades of green to me again, please.

A. Well, the two brighter shades are the reservoirs into which we will be injecting water. In the Blinebry, there's two different colors because the lower, paler green with the hatcher tends to have less reservoir and especially less good reservoir in it than the upper. We will perforate and produce reservoir intervals therein, but as far as injecting water into it, we do not feel that that would be a

paying proposition.

Q. And that's all oil in there?

A. It is all oil.

Q. Okay. Thank you. One quick question -- and you probably don't have to go to Exhibit 21 -- but you had mentioned your cross plot porosity.

A. Yes.

Q. What are you cross plotting? Is that neutron --

A. It's neutron density.

Q. You use a dual water model or --

A. Actually, for these, we have not used any type of water saturation cutoff. We have yet to test a wet well. Some of the wells drilled by Apache before the current staff and the current office took it over, we did not -- or those engineers, in general, in addition to other companies, didn't run resistivity logs, so without the resistivity log, I cannot calculate water saturation. So that severely reduces my database for mapping. So I'm trying to use as much data as I can.

MR. WARNELL: Okay. Thank you. I believe that's all our questions, Mr. Curtis. At this time, the witness may step down.

KEVIN MAYES

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.

A. My name is Kevin Mayes. I reside in Tulsa, Oklahoma.

Q. And who do you work for and in what capacity?

A. I'm a senior engineering advisor for Apache Corporation.

Q. Have you previously testified before the Division?

A. Yes, I have.

Q. And were your credential as an expert petroleum engineer accepted as a matter of record?

A. Yes, they were.

Q. Is this portion of Southeast New Mexico under your responsibility at Apache?

A. Yes, it is.

Q. And are you familiar with the engineering matters related to these applications?

A. Yes, I am.

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

MR. WARNELL: We certainly accept that.

Q. (By Mr. Bruce): As part of your job, Mr. Mayes,

with respect to these applications, have you made calculations regarding secondary recovery and the economics of the waterflood project?

A. Yes, I have.

Q. Let's start with Mr. Curtis' last exhibit, Exhibit 12. In looking at that, could you describe briefly the history of the pool, at least with respect to the proposed West Blinebry Drinkard Unit?

A. Now, I'll concentrate on the yellow-colored application that we had today, the West Blinebry Drinkard Unit. It is the Blinebry Drinkard Reservoir. It started producing back in the 1940s, so a lot of these wells are of vintage age. There have been 111 Blinebry, Tubb, and Drinkard wells drilled in this portion of the pool.

All these wells with the exception of one junked and abandoned well were productive. There were no dry holes drilled in the Blinebry, Tubb, and Drinkard. And currently, there are 91 active wells in the Blinebry, Tubb, and Drinkard in this portion of the field.

Q. Would you identify Exhibit 24, and describe production from wells in this area of the pool?

A. Exhibit 24 is a production graph. The red is gas production. The green is oil production. The blue is water production. And then there's a black curve that goes through there. That's actually a well count curve. I did want to

bring up from 2005 to the present on the well count curve it takes a significant drop. That's not actually a drop in well bores. That's actually one -- we consolidated the pools. We went from multiple completions being reported in the public data to true wells being produced. You can see it drop down to about 80 wells producing in 2006. We've drilled a few more wells. And again, we have the current active wells in the proposed unit at 91 wells.

Up in the upper right-hand corner, the graph, you can see the cumulative oil, water, and gas that's been produced out of this proportion of the pool. And then some notes that I have made on the graph, citing production in August of 2007 reached a recent peak of 13 million cubic feet of gas a day, 812 barrels of oil a day.

And then you can see a decline analysis I've done citing that the total remaining reserves from this pool under its current condition would be 2,135,000 barrels of oil. That's a significant number because that's the number where we will convert from phase one participation to phase two participation, which we will discuss in a minute.

Q. Okay. Is the waterflood project proposed a method of extending the life of this reservoir?

A. Yes, it is.

Q. What is the drive mechanism for the pool?

A. It's primary depletion solution gas drive at this

point.

Q. Now, before we discuss the recoveries, let's discuss the tract allocation formula. What is Exhibit 25?

A. Exhibit 25 is -- we're at Section 13 out of the unit agreement. It does define the tract participation throughout the life of the waterflood.

Of particular importance, again, is in Paragraph 2, the next to last sentence. You see where we again cite the 2,135,000 barrels of oil where we will convert from phase one to phase two participation. And then it goes on to define tract participation.

Phase one is 100 percent A over B. What this is is current rate. We made phase one based on the current rate coming out from each tract. It's defined as the production brought off of each tract in August of 2007. It is based on an oil equivalent basis. So we did take gas production into account also, and we ratioed the gas down to a barrel of oil equivalent based on a ratio of 6 to 1. So 6 MCF per day equated to one barrel of oil equivalent a day.

Then we'll move on. Phase two is defined as C and D down there. It is 100 percent C over D. It is based on cumulative oil produced off of each tract from inception through April 30th of 2007. What else you got attached here, Mr. Bruce?

Also attached to this exhibit is Exhibit B-2 out of

the unit agreement again. It just goes through each tract and defines each parties' interest in the tract and their participation, both phase one and phase two. So you can go through there and see how the tracts broke down.

Q. Would you describe for the Examiner the reasons for selecting these participation parameters as opposed to any other.

A. Yes. All the parties felt like a two-phase formula was appropriate. Some of the tracts have had a lot of work done on them, and production significantly increased. Thus, the cash flow to those particular participants -- it didn't seem fair to cut those cash flows just because we were forming a unit.

And then a cumulative oil for a phase two basis, everybody uses a secondary to primary ratio to look at how waterfloods -- how much secondary reserves should be assigned to a tract. As a result, cumulative oil seemed like a fair and reasonable participation to use in phase two.

Q. And in your opinion, does this formula allocate produced and saved hydrocarbons to each tract on a fair, reasonable, and equitable basis?

A. Yes, they do.

Q. Now, moving on to the next two Exhibits, 26 and 27, could you describe the data you used to determine the tract participation?

A. Yes. Exhibit 26 is -- I reviewed the offset mature waterfloods already in place in this area and in this reservoir. And I went through and looked at -- you can look at the left column, and go down the parameters that I felt were appropriate to review to determine how our flood would perform.

Those parameters included the oil production rate going into the flood; initial response period; a secondary response period; and then peak rate, the years to the peak rate. The GOR characteristics: Does the GOR collapse during the course of the waterfloods? Water production: Was there any early water breakthrough? How the water production increased with waterflood operations.

Looked at the initial injection rate to see how their injectors performed compared to how ours should perform. I looked at that S&P ratio as a secondary reserve as opposed to primary reserves ratio. So we looked at that on the three offset mature floods.

And then just working the spreadsheet from left to right, you can see I looked at those parameters for the Central Drinkard Unit, the CDU, Warren Unit, and then the Northeast Drinkard Unit, identified there as NEDU. And then I averaged how those offset floods performed, and I used that to determine how I felt our waterflood would perform.

Q. Okay. And then what does Exhibit 27 reflect?

A. Moving onto Exhibit 27, Exhibit 27 is a

volumetric sheet of how much oil is in place, how much oil we think we're going to recover with these waterflood operations.

The first set of calculations basically get that the original oil in place was 120 million barrels of oil. That is the two bright green areas of the reservoir that Mr. Curtis identified in his cross section. There is more oil in the lower Blinebry. But again, we don't know how much it's going to contribute to the waterflood.

Working our way on down Exhibit 27, the next group of calculations deals with accumulative recovery, remaining primary reserves, and ultimate primary recovery. There's two sets of calculations for each of those parameters. And what has happened is, I looked at it just on the initial 40-acre wells that develop this part of the field. And then there's been, as Mr. Curtis referred to, 40 20-acre infill wells already drilled, mostly in the north half of this field. So I looked at their performance also. Bottom line, doing nothing to this part of the field, the ultimate primary recovery would be 15.4 million barrels of oil or a 13 percent recovery factor.

And then the next two groups of calculations goes through the free gas saturations that is built up in the reservoir and how long fill-up time would take to collapse that gas back into the oil bands. And that calculates out as 9.6 years.

And then the last group of calculations deals with

the incremental reserves we think that this waterflood will recover. I did it in two parts also. If we would have waterflooded this with the wells just on 40 acres, and then if we would have done this with the field, completely drilled down to 20-acre well spacings, and then I subtracted out the reserves that are not currently -- the parts of the field that are not currently drilled down to 20 acres.

And bottom line, I came up with 6.1 million barrels that this waterflood ought to recovery, incrementally, which is an increment of 5 percent recovery factor.

Q. What does Exhibit 28 reflect?

A. Exhibit 28 goes through the 27 wells that we plan to convert from current production into water injection wells. And the bottom line there is we will look at losing 97.8 -- and these numbers are down at the bottom of the spreadsheet in bold. 97.8 barrels of oil a day, 413 barrels of water a day, and 1.7 million a day of gas production will be lost when we convert these wells from production to water injection.

Q. And what type of recovery are you predicting for the project? What type of ratio?

A. It's .4 secondary barrels to every one barrel of primary oil. Again, 6.1 million barrels of oil incremental to this project.

Q. What is the estimated life of this project?

A. I would refer the Examiners to Exhibit 29. It's

a production plot of how we feel this waterflood will perform. You can, of course -- the red is gas production; the green is oil production. You can see the 97-barrel a day drop in oil production when we convert these wells from production to injection. We pretty much plan on oil production being flat for a year and then starting to respond in accordance with the three offset analogous waterfloods that I looked at, again, 6.1 million barrels of incremental oil over a 44-year life.

Q. What type of injection pattern will you have? And I refer to Exhibit 30.

A. Exhibit 30 represents both our injection system on our production system that will be in existence during the operation of this waterflood. The red box in the middle of the field will be a central facility that we will build both to handle and process our produced fluids and to be in position for our source water and high pressure pumps for our water injection.

We will have two water source wells. They are in the blue hexagons there. One will be a re-entry to the San Andres Formation, and one will be a new drill to the San Andres Formation. And then you can see the yellow hexagons are our location of our injection wells.

Again, the north side of the field has been drilled down to 20-acre wells and, for the most part, will be 40-acre five-spot pattern on the injection. And the ~~south half of the~~

field is still pretty much on an 80-acre five-spot pattern.

Q. Would you discuss briefly the economics for the project? And I refer you to Exhibit 31.

A. Exhibit 31 is just a summary sheet of the economics to all parties. It's going to take $10.6 million to install this project. I cite the incremental reserves as 5.9 million barrels of oil versus the 6.1 I've talked about. Whenever we ran it through our economic models, they cut off a little bit of the reserves. We'll actually cite 5.9 after economic modeling.

You can see the project is very attractive to all parties, the working interest owners, the mineral owners, and the State of New Mexico through increased tax revenues. The working interest owners should realize a benefit of after-tax present value discounted at 10 percent of $77 million, so a 67 percent rate of return on their investment. Mineral owner, the same present value is calculated at $18 million dollars, and the State of New Mexico is $8 million of present value in increased tax revenue. So it's an attractive project to everybody.

Q. So the project will be economic?

A. Yes, it will.

Q. Is the portion of the pool being unitized suitable for waterflooding?

A. Yes, it is.

Q. Is the project area so depleted that it's prudent to apply an enhanced recovery program at this time?

A. Yes, it is.

Q. In your opinion, is the waterflood project technically and economically feasible at this time?

A. Yes, it is.

Q. Will the value of the oil and gas recovered by unit operations exceed the unit costs plus a reasonable profit?

A. Yes, it will.

Q. Will waterflood operations result in the recovery of substantially more hydrocarbons from the pool than will otherwise be recovered?

A. Yes.

Q. Will unitization and secondary recovery benefit working interests and royalty owners in the unit?

A. Yes, it will.

Q. And is unitized management an operation of this portion of the reservoir reasonably necessary to effectively carry out waterflood operations?

A. Yes, it is.

Q. Because of this estimated additional production, do the wells in the proposed unit qualify for the recovered oil tax rate?

A. Yes, it does.

Q. Depending on the price of oil? One thing you did

mention, Mr. Mayes, that there were 91 active wells, and the total current production is what? About 812 barrels a day?

A. That's correct.

Q. So even though you mentioned development, the wells are small producers at this time?

A. That's correct.

Q. Now, let's move on to the injection application. What is Exhibit 32?

A. Exhibit 32 is the New Mexico Oil Conservation Division form C-108, Application for Authorization to Inject.

MR. BRUCE: And, Mr. Examiner, for ease of reference, in the lower right-hand corner, the pages have been numbered in case Mr. Mayes needs to refer to anything.

Q. (By Mr. Bruce): Mr. Mayes, let's start off with the injection wells. How will they be completed? And if you could refer to the pages for the Examiner to look at.

A. Yeah, for all 27 wells we plan to convert from production to injection we have drawn up a schematic and posted all the pertinent information required in the C-108 application. Those schematics run from Page 3 to Page 29.

Q. Could you discuss a typical completion?

A. Yeah. The most important thing is the top of cement, and basically we found top of cement on all strings of casing from four sources. One either -- in the records, it's denoted that cement was circulated to the surface while

installing that casing. That is designated by the initials CIRC. Where appropriate, a second item was -- if the top of cement was determined by a temperature log, then that's denoted by the initials TS on the schematic.

The third way of determining it is a cement bond log, and that is designated by the initial CBL where that is pertinent. And then the fourth way is to calculate the top of cement. And where we calculated top of cement, we utilize the appropriate size of bore hole, the appropriate size of casing. We used a 1.41 cubic feet per sack for the yield on the cement, which is pretty standard in this area. And we used a 25 percent excess to the size of the bore hole to allow for washouts and other issues.

All the injectors do appear to be in good mechanical shape with the exception of four that I would like to discuss with the Examiner. The first one to discuss would be the Lockhart A-17 #04 well on Page 18. This is a well that has actually been re-completed out of the Blinebry, Tubb, and Drinkard Formation and into a shallower Penrose Formation. It is currently producing in economic quantities out of the Penrose.

Our intent is to drill a twin well to the Penrose to capture the reserves and re-enter this well and squeeze off the Penrose and make it into a Blinebry and Drinkard injector. This is a well that is not on the -- that is not going to come

into the unit as inventory. We're going to leave it outside of the unit for the time being. We will -- it's going to be our last conversion, so it will probably happen in January of next year. But we did want to go ahead and get the permission to inject into the Blinebry and Drinkard at this time, so that's why -- that's one I wanted to discuss with you.

The next one would be the Southland Royalty #4, which is on Page 21. Again, similar situation. The Blinebry, Tubb, and Drinkard had been abandoned, and this well has been re-completed up in the Grayburg. It is uneconomic in the Grayburg at this time. So our intent is to inventory it into the unit, squeeze the Grayburg and make an injector out of it in the very near future upon receiving approval for this unit.

The third well would be the ~~Southland Royalty #07~~, which is on Page 24. Same situation, the Blinebry, Tubb, and Drinkard Formations have been abandoned. This well has been re-completed in a shallow Grayburg zone again. Again, the Grayburg is uneconomic in this well, so we will be inventorying it into the unit. We will be squeezing the Grayburg and making a Blinebry and Drinkard injector out of it as well.

MR. WARNELL: That's the Grayburg there? 38, 20, 63?

THE WITNESS: That's correct. Yes, sir.

A. And then the last well is the ~~State C Tract 12 #3~~ well, which is on Page 26. Same scenario, and this well is actually completed in the Penrose and is at this time T and A'd

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with a cast-iron bridge plus and a cement up hole. Again, we'll clean that all out, squeeze the Penrose, inventory this well into the unit and make an injector out of the Blinebry and Drinkard out of this well. All the other injectors appears to be in good mechanical shape to be used as injectors.

Q. (By Mr. Bruce): And so you wanted to point out the wells that are currently completed in another zone rather than the BTD zones in this reservoir?

A. That's correct.

Q. How many wells are there in the area of review?

A. There were -- and I'll refer the Examiners to Page 31, which is our map, again, of all of the -- the half-mile radius around all the proposed injectors. ~~Within that area of review, there were~~ 170 ~~wells~~ that we reviewed the mechanical integrity of. We posted that information on a spreadsheet which runs from Page 32 to 36.

For the Examiner's convenience, we did organize this with the first page, Page 32 being the proposed injection wells. And then the next two pages, Pages 33 and 34 are the producing wells coming into the unit. And then the next two pages, Pages 35 and 36 are the wells outside of the unit.

We can certainly send this spreadsheet to the Examiners in an electronic form so that you can sort it any way you would like to make it easier for you to look at all these -- the mechanical integrity of all these well bores.

Q. Are any of the wells in the area of review plugged and abandoned?

A. Yes. We did find six plugged and abandoned wells. They all appeared to be plugged according to the OCD requirements. We did provide schematics and, where appropriate, detailed reports of these wells, and that runs from Page 37 to Page 49.

Q. And are the wells in the area of review properly completed or plugged and abandoned so as to prevent movements of fluids between zones?

A. I believe so, yes.

Q. Would you summarize the proposed injection operations? And I refer you to Pages 50 through 52.

A. Yes. Item No. 7 on Form C-108 deals with injection volumes and injection pressures. Based on the analogous offset floods, we think we'll average 490 barrels of water a day per injector. We don't see any single injector going over 1000 barrels of water a day injection. The injection pressure, the shallowest top perforation we have in any proposed injector is at 5602 feet. So per the OCD requirements of .2 psi per foot per surface injection pressure, we would be asking for a maximum surface injection pressure of 1120 pounds at this time. Of course, we will subsequently run step rate tests and see if we can justify an increase in that pressure.

Q. Is there a proposed stimulation program for the injection wells?

A. All the wells will be acidized in the Blinebry and the Drinkard upon conversion from production.

Q. And are there any water wells within this area?

A. Yes. And I've attached, again, in accordance with the State Engineer's Office, a list of all water wells of record in the area of review. Those are attached on Pages 53 and 54. The deepest of those wells is 163 feet.

And again, to confirm what Mr. Curtis said, to that depth we will have at least two strings. All the wells in the area of review will have at least two strings of casing cemented back to surface covering down to that depth.

Q. What is the source of your injection water?

A. Of course, we'll be bringing produced water back into the central facility. We will use it for the reinjection. We will have makeup water from the San Andres Formation from the two source wells that we discussed earlier.

Q. Is there any problem between the San Andres water and Blinebry or Drinkard water?

A. No, there isn't. The San Andres has been the source water for the three offset mature floods that they've been using since the mid 1970s. No major problems between the San Andres water and the Blinebry and Drinkard waters.

Q. So you don't anticipate any compatibility

problems between those two sources of water?

A. No, we do not.

Q. And what is Exhibit 33?

A. 33 is the start of the plan of operation that we'll submit to the BLM and the State of New Mexico upon statutory unitization. What Exhibit 33 is is a list of all the wells that will be coming into the unit inventory with their old lease name and lease well number and their new proposed unit number in the right-hand column.

Q. And this identifies the injectors also?

A. That's correct.

Q. In your opinion, is the granting of this application in the interest of conservation and the prevention of waste?

A. Yes, it is.

Q. And were Exhibits 24 through 33 prepared by you or under your supervision?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 24 through 33.

MR. WARNELL: Exhibits 24 through 33 are so admitted.

MR. BRUCE: I have no further questions of the witness.

MR. BROOKS: No questions.

MR. WARNELL: Richard?

EXAMINATION

BY MR. EZEANYIM:

Q. Your name, again? I forgot.

A. Kevin Mayes.

Q. Mr. Mayes. Thank you for testifying. First of all, I don't see very well. But this spreadsheet on the area of review wells is very tiny.

A. Yes, sir.

Q. Is there any way we can blow it up so I can read it? I tried to read it, but I couldn't.

MR. BRUCE: He can e-mail it to you.

Q. (By Mr. Ezeanyim): Yes, I would appreciate that. It is very important to have that information. Because I would like to run through it.

A. Yes, sir.

MR. WARNELL: The same, Mr. Mayes, with some of the spreadsheets.

THE WITNESS: Absolutely.

Q. (By Mr. Ezeanyim): Okay. I think it was a good presentation, but I still have a couple of questions to clarify what you have said here.

From your testimony, I think this is a really good project. If you can make almost 7 percent return, that's excellent. So I'm not even going to go to the cost to ask if your project is economic or not.

Are you in the Blinebry, the Tubb and the Drinkard, right?

A. That's right.

Q. What would be your perforation intervals where you start injecting? Is that going to be just the Tubb and Blinebry or the Drinkard -- or I mean, the Drinkard or what? All three formations?

A. No. It'll be -- to start out with, it will be the Blinebry and the Drinkard. Those are the two known gas reservoirs -- I'm sorry -- known oil reservoirs, and that is what is waterflooded in the offset waterfloods. The Tubb is an interesting animal. As you go down structure, it can get to an oil saturation that may justify water flooding. As a result, we want to unitize that and have that option available to us.

Q. But you want to target this in case you see something there?

A. Yes, sir.

Q. But I guess it's the Blinebry and the Drinkard?

A. Those are proven, yes, sir.

Q. And then the injection intervals is all in this C-108?

A. Yes, it is.

Q. On the wells, you're going to use about 27 injection wells that are currently producing, right?

A. Yes, sir.

Q. You're going to convert them. And you don't have the schematics for -- what will they look like? Where are you converting them -- do you?

A. No. But I can provide those to you.

Q. That's really what we're looking at.

A. Okay.

Q. Because if you provide the schematics on what they would look like, then that would reduce the amount of remedial work you may be required to do. You are talking about squeezing the Grayburg and other wells. If you provide -- if you squeeze it off and provide a schematic -- so you have the engineer evaluate what more work is necessary to be done, maybe there will be no work if you provide that information on the injection wells, the 27 injection wells you are going to convert?

A. I can do that.

Q. We would like to have those schematics, where they are cemented, those wells, and then the stops and -- but some of them are circulated on those wells.

A. Well, our priority was if we could find a record that said it circulated, we honored that first. And then if we could find a temperature log in the records, we honored that second. And then if we could honor a cement bond log in the records, third, we honored that. And then calculating it was our last resort.

Q. I do have a problem with calculating the cement tops because sometimes it doesn't give you an accurate cement top. And then if we -- it's up to our judgement that it might need something. But if you don't have any others, that's all you have to do, but we need to see the calculation that you have for the cement tops.

A. Okay.

MR. WARNELL: Would it be possible to go into some of those wells and run ~~CPO?~~ CBL

THE WITNESS: Well, I mean, it's difficult. You're taking a well offline, and you're losing production. It's not desirable.

Q. (By Mr. Ezeanyim): It's not desirable, but can you do it? If we tell you you have to do that, can you do it?

A. I mean, it's possible, yes.

Q. It's possible. Okay. And you say you are going to use two types of spots, 40-acre to 20-acre five-spots, right?

A. I'm sorry?

Q. 40-acre five-spots? What portion are you going to use for the waterflood?

A. The way the field is developed at this time, it lends itself to putting in a 40-acre five-spot on the north half of the field and a 20-acre five-spot on the south end of the field.

Q. Does that mean that those that would most -- give you the most value?

A. Yes. And the intent is to go ahead and get the waterflood started up, start pressuring up the reservoir, and then we'll develop the south part of the field.

Q. Okay. Is your well now currently water producing, just the well? Do you have any idea?

A. On average oil production?

Q. Yes.

A. Actually, it's on one of my exhibits.

Q. Yeah, it is, but --

A. 8.9 barrels of oil a day is the average.

Q. Per well?

A. Per well.

Q. 8.9. Okay.

A. Yes, sir.

Q. I don't know. Are you -- did we talk about the freshwater zone in this area?

A. Okay.

Q. So we have the water analysis?

A. We did not get a water analysis. We can get that. We talked to Ken Fresquez at the New Mexico State Engineer's Office. He's the keeper of the freshwater. And we had an extensive conversation with him about what depth freshwater existed to, and he basically cited 130 feet as the

base of freshwater. And then I cited in my testimony that the deepest water well in the area is 163 feet, and cited that all the wells we reviewed cover that up substantially.

Q. That may be no issue, but we need to get a freshwater for our records to see what is happening there.

A. Got it.

Q. If you go to area of review, how many wells do we have in the area of review? Did you say 170?

A. 170, yes, sir.

Q. 170, and they are all contained here. Out of those 170, how many have been plugged and abandoned?

A. Six.

Q. Six have been plugged and abandoned. With the rest of the wells, what are they doing now?

A. They're producing. 111 -- or I'm sorry -- 91 of them are currently producing in the -- well, I take that back because there are some wells outside the unit that are still within the area of review. They are producing wells.

Q. Okay. That's it for this one. So out of the 170, six are plugged and abandoned, the rest of 164 are producing?

A. Yes, sir.

Q. Okay. And the information is contained in here whether they are plugged and abandoned or currently active?

A. Right. All the mechanical details on all 170

wells is on that spreadsheet.

Q. Okay. Very good. So what we need of those injectors -- I mean, those wells that are you going to convert --

A. Absolutely.

Q. -- tell what you are going to do. Are you going to squeeze off? Because those are the primary actions we look for the injectors. That's where you -- I know you're not going to do it on there. You're going to pressurize it, and you're going to do 2 psi a foot?

A. Correct.

Q. Okay. So if we could get the spreadsheets of those wells so I can read about it. I don't mean to -- what else do I need here?

A. Freshwater.

Q. Yeah. Freshwater. We need that. Are you asking for saturation for the oil tax rate?

MR. BRUCE: Even though it may not be useful at this time, we are still requesting it.

MR. EZEANYIM: Yeah. I don't know whether you would get that in 100 years. I don't know when the price will come back from 130 to 28.

This is a good project. I have no more questions.

MR. BROOKS: I do have one question. What oil price do you use in your economic?

THE WITNESS: On that summary sheet? It was a 10-year strip price a couple of months ago. I believe it was $86 a barrel. I could double check that for you if you'd like. It's changed a little.

MR. BROOKS: Yeah. It's changing very rapidly these days.

MR. EZEANYIM: What is it today? Is it $126? But you used $86. That's okay. Then trying to do your analysis, why did you use 10 percent to estimate that?

THE WITNESS: It's a corporate rate.

MR. EZEANYIM: Corporate, okay. And that is internal?

THE WITNESS: Internal to us, yes. Internal to Apache.

MR. BROOKS: That's all I had.

EXAMINATION

BY MR. WARNELL:

Q. Okay. Mr. Mayes, very impressive set of exhibits from all of you gentlemen.

I do, however, have a question on Exhibit No. 26. If you could help me out there a little bit. On your first line item, oil, IP, that far right-hand column, how does that average to 8.9 barrels per day?

A. What does it average out to be, sir?

Q. It just kind of caught my eye that -- and are you

averaging --

A. Oh, oh. That is not an average number from the three offset floods. That is actually the oil rate that existed when the waterflood was installed. I'm sorry.

Q. And you've got it right there. I just wanted you to know I was paying attention.

A. I apologize for that.

MR. EZEANYIM: Does CDU have the 20 units? What does CDU mean?

THE WITNESS: CDU stands for Central Drinkard Unit, which is on that plat we gave you, the five offset units, that's the southern one. The Warren Unit is a Blinebry, Tubb, Drinkard waterflood. It's north of us. And the NEDU is the Northeast Drinkard Unit, which is directly to the east.

MR. WARNELL: Okay. That's all I really have. Mr. Bruce?

MR. BRUCE: I have nothing further in this matter, Mr. Examiner.

MR. WARNELL: The witness may step down.

MR. BRUCE: I would simply ask that both cases be continued for two weeks so I can submit the additional notice material.

MR. WARNELL: So be it. We'll continue both of the cases until June 12th.

MR. BRUCE: May 29th.

MR. WARNELL: May 29th. Cases No. 14125 and 14126 will be continued to May 29th.

[Hearing concluded.]

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____, heard by me on _____.

_____, Examiner
Oil Conservation Division

REPORTER'S CERTIFICATE

I, JOYCE D. CALVERT, Provisional Court Reporter for the State of New Mexico, 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 and was reduced to printed form under my direct supervision.

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 proceeding.

Joyce Calvert

JOYCE D. CALVERT
New Mexico P-03
License Expires: 7/31/08

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, JOYCE D. CALVERT, a New Mexico Provisional Reporter, working under the direction and direct supervision of Paul Baca, New Mexico CCR License Number 112, hereby certify that I reported the attached proceedings; that pages numbered 1-60 inclusive, are a true and correct transcript of my stenographic notes. On the date I reported these proceedings, I was the holder of Provisional License Number P-03.

Dated at Albuquerque, New Mexico, 15th day of May, 2008.

Joyce D. Calvert
Provisional License #P-03
License Expires: 7/31/08

Paul Baca, RPR
Certified Court Reporter #112
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