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:

APPLICATIONS OF MEWBOURNE OIL COMPANY

CASE NOS. 10,959 10,960

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: JIM MORROW, Hearing Examiner

April 28, 1994

Santa Fe, New Mexico

MAY 19 1994

This matter came on for hearing before the Oil Conservation Division on Thursday, April 28th, 1994, at Morgan Hall, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

April 28th, 1994
Examiner Hearing
CASE NOS. 10,959, 10,960

* * *

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A P P E A R A N C E S

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By: JAMES G. BRUCE

* * *

WHEREUPON, the following proceedings were had at 9:24 a.m.:

EXAMINER MORROW: Call Cases 10,959 and 10,960 at this time.

MR. CARROLL: Application of Mewbourne Oil Company for statutory unitization, Lea County, New Mexico.

Application of Mewbourne Oil Company for approval of a waterflood project and qualification for the recovered oil tax rate, Lea County, New Mexico.

EXAMINER MORROW: Call for appearances.

MR. BRUCE: Mr. Examiner, Jim Bruce from the Hinkle law firm in Santa Fe, representing the Applicant, and I have two witnesses to be sworn.

EXAMINER MORROW: Will the witnesses please stand and be sworn?

(Thereupon, the witnesses were sworn.)

EXAMINER MORROW: Go ahead, Mr. Bruce.

KENNETH M. CALVERT,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is Kenneth M. Calvert, and I live in

Lindale, Texas.

Q. What is your occupation and who are you employed by?

A. I am the engineering manager of secondary recovery for Mewbourne Oil Company, and my office is located in Tyler, Texas, and I'm a registered professional engineer in the State of Texas.

Q. Okay. Have you testified before the Division previously?

A. I have testified before the Commission previously as an engineer, but not as a land person.

Q. Okay. Would you please outline your educational, employment background, especially with respect to land matters?

A. Yes. In 1964, January of 1964, I received a BBA in petroleum land management from the University of Texas, and in August of 1964 I received a BS in petroleum engineering from the University of Texas.

I was employed out of college as an engineer for Tenneco Oil Company from the years 1964 to 1981. In 1981 I became engineering manager -- or manager of engineering and operations for Mewbourne Oil Company. That position I held till 1989.

From 1989 to present, I have been manager of secondary recovery because of the high level of activity

that we have had in secondary recovery. And since that time, I have supervised all land work in relationship to unitization, both in Texas and -- excuse me -- Well, Texas, Oklahoma and New Mexico.

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

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Calvert as an expert landman with respect to unitization proceedings.

EXAMINER MORROW: Mr. Calvert's qualifications are acceptable.

THE WITNESS: Thank you.

Q. (By Mr. Bruce) Mr. Calvert, will you briefly describe what Mewbourne seeks in these two cases?

A. Okay, in Case 10,959 Mewbourne seeks to statutorily utilize the interests that have not voluntarily joined the proposed unit in the Querecho Plains-Queen Associated Sand Unit as it is proposed, and that includes parts of Sections 21, 22, 23, 26, 27 and 28, all in Township 18 South, Range 32 East. This is approximately -- the unitization of approximately 1520 acres.

And in Case 10,960 Mewbourne Oil Company seeks approval of secondary recovery through waterflooding and certification for the recovered oil tax rate.

Q. And all of the unit land is federal land, is it

not?

A. Yes, it is.

Q. Would you then refer to Exhibit 1 and identify that for the Examiner?

THE WITNESS: May I ask, do the Commissioners -- or the Examiners -- have these in sequence now?

EXAMINER MORROW: We have Number 1 on top.

THE WITNESS: Okay.

EXAMINER MORROW: We haven't looked yet deeper than that.

THE WITNESS: All right. Exhibit Number 1 is the land plat that outlines the proposed Querecho Plains-Queen Associated Sand Unit, and that would be the -- Sort of on the periphery of the number of circled wells there is a hard dashed line. That is the outline of the unit boundary.

There are other small dotted lines within the unit boundary, and some of it outside the unit boundary, which are lease lines, or are tract boundaries where in a given tract there is different mineral ownership due to participation, nonparticipation, various overriding royalties and so forth.

So all of the tracts that are herein designated are designated on a common mineral ownership.

Q. (By Mr. Bruce) How many tracts are there?

A. There are 21 tracts.

Q. And who operates the tracts currently?

A. Mewbourne Oil Company or Curtis W. Mewbourne individually operate 16 of the tracts, Anadarko operates four of the tracts, and Clarence Stumhoffer, an independent, operates one tract.

Q. Would you refer to Exhibit, 2, the bound volume, and discuss that for the Examiner?

A. Okay, Exhibit 2 is, the flysheet on it, *Plan of Unitization, Querecho Plains Queen Associated Unit, Lea County, New Mexico*, and it covers the unit area shown in Exhibit 1.

The unitized formation is herein defined, the unitized substances are both the oil and associated casinghead gas.

Mewbourne Oil Company is requesting to be named the unit operator, of which "Mewbourne" could be removed under terms of this agreement. And it provides for the expansion of the unit area.

The unit agreement -- Incidentally, Mr. Examiner, this book is made up of two parts. The first part is the unit agreement, which is the relationship of all of the work- -- all of the various interest owners, including royalty interest, which is the BLM. There are 76 overriding royalty interest owners, and the working

interest owners.

It provides for the proper apportionment of production and revenues generated from the unit.

Q. And what is the second part of this document?

A. The second part of the booklet is the unit operating agreement. And the unit operating agreement provides the relationship between the unit operator and the various other working interest owners, other than the unit operator.

It sets forth the duties and authorities of the unit operator, and there is provision for apportionment of expenses between the various working interest owners, of which Mewbourne Oil Company is a working interest owner.

Q. Now, these agreements were drafted under your direct supervision, were they not?

A. Yes, they are, and I might mention that this particular plan of unitization is very similar, with some very minor, revisions to that which approved the Querecho Plains-Bone Spring Sand Unit under Commission Order R-9985, which became effective November 4th -- excuse me, November 1st, 1993.

The Bone Spring, just for informational purposes, it has nothing to do with this unit, but it underlies a lot of common tracts that are proposed in this unitization.

Q. Okay. Now, you referred to the unit agreement

and Exhibit B to that unit agreement that describes the tract ownership. How did you come up with the names on the Tract Ownership?

A. Okay, hold on just a minute. Okay. Under Exhibit B -- and let me direct the Examiner to that. The first part of the booklet here is the unit agreement. And it would be found -- Exhibit B would be found two pages beyond page 50, so Exhibit B is not -- That's right -- Hold it up again, please, sir? That's Exhibit B, okay. I just wanted to make sure we're on the same wavelength here.

Okay, Mewbourne Oil Company, as I said, operates 16 of the tracts, and so the first thing that we did was to use the Division orders that we currently have in place. And in tracts wherein we were not the operator and did not hold Division orders, we obtained title opinions on each of these tracts.

In addition, we obtained the pay sheets and the -- from the various purchasers and the other two operators in order to confirm title opinions that we obtained on tracts that we did not operator.

Q. Okay. Could you then move on to the next booklet, Exhibits 3 and 4, and first identify the working interest owners and whom you seek to unitize?

A. Excuse me, Mr. Examiner. Okay. The next booklet that you have has a flysheet that's also *Plan of*

Unitization, Querecho Plains Queen Associated Sand Unit, Lea County, New Mexico. But in the bottom of it, it is designated "Exhibits 3/4", so there's two exhibits in this same book.

Okay, the first page, immediately behind the flysheet, is a list of all working-interest owners within the Querecho Plains-Queen Associated Sand Unit.

Q. And which of those persons on that list do you seek to unitize?

A. Okay, all of the working interest owners who have a "1" to the left of their name have voluntarily joined the unit. So we have 97.4 percent of the working interest owners that have voluntarily joined the unit.

The remainder that do not have a "1" beside their name to the left are interests that we seek to statutorily include -- or statutorily unitize, excuse me.

Q. Now, there's a couple of exhibits, 3A and 3B, fitted in. What are those, just for the Examiner's information?

A. Okay, Exhibit 3A is a late submittal of the Anadarko Petroleum signature that we received too late to put in these booklets, in that we left Tyler two days ago and we didn't get those till yesterday. So that's Exhibit 3A.

Exhibit 3B is a similar exhibit from OXY, wherein

OXY and NAPECO are committing their interests, and here again we did not have the opportunity to bind these in a book, but they are a part of the working interest signators.

Now, while I'm speaking to working interest signators, let me also state that Anadarko is an overriding royalty interest owner. And so by the dual capacity joinder provision of the unit agreement, their signature as a working interest owner is also their signature and approval as an overriding royalty interest owner.

Q. Then move to Exhibit 4 and identify which royalty interest owners you seek to have pooled or, excuse me, have unitized.

A. Okay, let me direct our attention to -- the Examiner -- Exhibit 4 begins behind a heavy manila flysheet. There you are. That begins Exhibit 4.

That is a list of all royalty owners which -- that is only the BLM and the various overriding royalty interest owners. And as in the previous exhibit, all of those interests that have a "1" to the left of their name have signed and voluntarily joined this proposed unit.

And out of those we have 95.5 percent of the royalty and overriding royalty interest committed voluntarily to this unit. Therefore, the remainder, 4 1/2 percent, are those that have not committed interests to

this -- to the proposed unit, and we seek to statutorily unitize those individuals.

Q. Has the BLM preliminarily approved the unit?

A. Yes. The next page behind the listing of the various royalty and overriding royalty interest owners is the letter of designation for this unit from the BLM. Upon the entry of an order by the New Mexico Oil Conservation Commission, the BLM will provide a letter of certification of this unit.

Q. Would you describe Mewbourne's efforts to obtain the voluntary commitment of the working and royalty interests in the unit? And I would refer you to Exhibits 5A through 5B.

A. Okay. First, before we get to 5A and 5B, let me start out by saying that we had a -- the very first meeting of the operators and some common working interest owners on November -- I believe it was November the 4th, 1993, being the same date that we had the organizational meeting for the Querecho Plains-Bone Spring Unit.

Following that organizational meeting, we had a preliminary meeting of the Queen owners, working interest owners, to initiate the unitization of the Queen zones.

Shortly thereafter, January the 1st -- excuse me, January the 10th, and which that is a letter marked as Exhibit 5A, I proposed for the benefit of Mewbourne Oil

Company the unitization of the previously described acreage.

At that date, all working interest owners were sent out a proposal which gave an estimate of expected rates of return, return on investment, recovery and so forth.

Q. Now, this letter, Exhibit 5A, or the January 10th letter, we only submitted the letter addressed to Anadarko. Were all working interest owners sent similar letters?

A. Yes, the only reason that we have picked Anadarko here, at the time the exhibits were put together, Anadarko, we did not have their signature yet, and so I just simply picked out the first working interest owner in the alphabet as a demonstrative exhibit, and so that's Anadarko. Everybody else received a very -- not a very similar, an exact letter to this.

Q. And then on the last page of Exhibit 5A is a letter dated February 7th. What was that letter?

A. Okay, the letter dated February the 7th, which is the third page of your Exhibit 5A, is a letter wherein I sent to each of the working interest owners who had not yet voluntarily joined the unit by their authorized signatures. These letters were sent out by certified mail, as you see the certification number above Anadarko Petroleum. These were sent out to all working interest owners who had not

yet approved the unit.

Q. Okay.

A. So this certification was to make certain that everybody did get the unitization agreement and were again put on notice by certification that they should have the unitization proposal in their hand.

Q. Now, Exhibit 5B, would you refer to that and discuss the follow-up contacts with the nonconsenting interests?

A. Okay, Exhibit 5B, after some preliminary titling there, is our *Working Interest Owners Contact Report*. This is our efforts to -- further beyond the letters, to further get voluntary joining in this unit.

And here again, these are listed alphabetically. If you'll notice, there's Anadarko Petroleum, their certified letter, and we do not have any contacts listed there in that we had numerous contacts with Anadarko. But beyond that point -- If we need to go into all of them, we can, but there's a listing of each person that has not joined and a brief listing of telephone conversations and so forth.

I might point out that Mr. Stumhoffer, who is the operator of one well, has several associates that you will see in the various individual contact reports wherein he was attempting to buy various interests and he was also

attempting to get them to join the unit. And as it turns out, Mr. Stumhoffer, we do not know whether he ultimately bought these people or not; but he, at this point in time, has not joined the unit.

And so -- A lot of it centers around a well called the Flip Federal Number 1, wherein there were some 15 or so working interest owners, and a lot of those owners have not joined the unit. And that comprises a large part of nonvoluntary unitization working interest owners.

Q. Would you then just briefly describe Exhibits 5C and 5D with respect to the royalty owners?

A. Unless the Examiner would like for me to go into more detail, the exact same process through letter of notification on January the 10th and follow-up of the certified letter on January the 7th -- excuse me, February 7th, 1994, plus Exhibit 5D is the various telephone conversations and so forth that we had with other overriding royalty interest owners, and they're self-explanatory unless there's specific questions that someone would like to ask.

Q. Were there any unlocatable interest owners?

A. Yes, there was one -- As it turned out, there was one unlocatable royalty interest owner. There was -- We had no working interest owners that were not locatable. There was one royalty interest owner.

Q. And what is her name?

A. This is Lita Sabonis.

Q. And what is Exhibit 6?

A. Exhibit 6 is our notification through publication in the *Hobbs Daily News* wherein we notified Lita Sabonis by publication of the hearing to be held relative to this unitization proceeding.

Q. In your opinion, has Mewbourne Oil Company made a good-faith effort to secure voluntary unitization?

A. Yes, we have.

Q. And has written notification of this unitization hearing been given to all parties who have not consented to the unitization?

A. Yes.

Q. And is the affidavit of notice submitted as Exhibit 7?

A. Yes.

Q. Does the unit operating agreement contain a provision for carrying working interest owners?

A. Yes. In the unit operating agreement, Section 10.4 provides for the carrying of working interest owners in the normal unit operating expense, and that's provided in Section 10.4 of the unit operating agreement.

Q. And does the operating agreement also provide for a penalty against non-consenting working interest owners?

A. Yes, that is provided for in Section 10.5, and that is a cost, plus cost of installation, plus 200 percent.

Q. And in your opinion, is that fair?

A. Yes.

Q. What overhead rates does the operating agreement provide for?

A. The operating agreement provides -- as far as drilling and producing well overhead, it provides for $4600 per month for a drilling well and $511 per month for a producing well.

These -- This $4600 was previously negotiated between those members that had signed, and the $511 was the weighted average of all producing well overheads that were brought into the unit, and it is less than the *Ernst and Young* report. I believe the *Ernst and Young* for 1992 was something like $550 or so.

Q. Now, since the operating agreement was printed, have there been any changes to it?

A. Yes, that can be found in Exhibit 8. These were, for the most part, typed revisions for better understanding. And Exhibit 8 is divided in unit agreement, unit operating agreement and accounting procedure.

I will mention that in the unit agreement portion of it, all of those were strictly for amplification

purposes only. For all intents and purposes it is exactly the same as was provided in the Querecho Plains-Bone Spring Sand Unit that I mentioned previously that was approved by this Commission.

Under the unit operating agreement, you will note at the bottom of the page, Article 3.6.2. That was a change in the voting requirements, so that was a change. And in order for something to be approved, capital expenditures to be approved, 75 percent must approve any expenditure.

There is a provision, however, that if a working interest owner has more than 25-percent working interest, they do not have total veto; they must be joined by one other working interest owner to kill a proposal.

Article 10.5, which is on the second page of your exhibit, that is a change in that if there are wells to be drilled, rather than the unit operator having a total option of notifying various other working interest owners of nonconsent or nonpaying working interest owners for capital expenditures for development drilling, then other working interest owners have the option of participating and carrying that interest in the same proportion that they own a working interest in the unit.

Q. And these changes will benefit all of the working interest owners, will it not?

A. That is true. The remainder, throughout the rest of the exhibit is amplification for better understanding. But it really doesn't change the meaning of the unit agreement that you might have in hand.

Q. And these were proposed by other working interest owners; is that right?

A. That is true.

Q. Are there any typographical errors that will be corrected?

A. Yes, there are some very minor typographical errors that I have presented as Exhibit 9, "Accounting Procedure Errata", and those strictly have to do with paragraph nomenclatures and reference numbers.

Q. In your opinion, will the granting of these Applications be in the interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. And were Exhibits 1 through 9 prepared by you, under your direction, or compiled from company records?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 1 through 9.

EXAMINER MORROW: 1 through 9 are admitted into the record.

EXAMINATION

BY EXAMINER MORROW:

Q. Mr. Calvert, does this include all the pool or field as being -- will be waterflooded? Is all of it included, or is only a portion of it?

A. Well, I'm not certain about the -- if there are any other wells that might be carried under the allowable schedule of Querecho Plains-Queen Associated. There are various Queen wells scattered throughout the area. I will point some wells out to you that are part of two other floods or lease floods.

Now, let us look at -- On Exhibit 1, which is the map, in Section 28, in the northwest quarter of the northwest quarter, there shows a well with a circle around it, and that is a Queen well. Right straight above that well is another Queen well. Those wells are included in the Young Queen unit, and so those wells are in another unit.

There is a 40-acre proration unit gap between the western edge of our proposed unit and the eastern edge of the Queen -- of the Young Queen Unit.

I direct your attention to Section 24 on -- it will be the second section down from the right -- on the map, and there are wells there indicated as Cinco de Mayo. There are two wells that show to be plugged, that have been

previous Queen producers.

Both of those two wells have been saltwater disposal and/or injection wells on the Cinco de Mayo lease, operated by someone else, other than Mewbourne, that have possibly been an attempt at secondary recovery. And those wells, the wells that I have mentioned, obviously are not included in this unit.

Other than that, I believe that -- No, let me go back to one other area.

In Section 27, the south half of the southwest quarter, there are three wells that are completed in the Queen that shows to be plugged.

The Number 1 and Number 6 wells, which are the east two wells of that south half, southwest quarter, were previously injectors into the Queen. They obviously were watered out.

The Number 4 well was watered out.

And then Mewbourne Oil Company purchased the Number 2 and 3 wells, which is in the north half of the southwest quarter. Those wells will be used as injectors. But since the three wells in the south half had been injected to and/or produced prior and watered out, they were excluded from this unit.

I believe that includes all wells that could be construed to be in any shape, form or fashion, possibly a

portion of this reservoir.

Q. So these other wells, like those in -- on the east line of Section 21 and northwest quarter of 22 and northeast quarter of 23 and so on, are those to different horizons or --

A. What is shown on this map are all Queen penetrations. The wells that you have mentioned are Delaware and Bone Springs, and there's one Strawn well in there, and I believe there's one Morrow well shown.

So the remainder of the wells that you see on there, other than the ones that I've mentioned, are to deeper horizons.

Q. Okay. So essentially, then, it does include all the wells which would be in this reservoir, at least -- Is that --

A. I believe engineering testimony will further define that for you, sir.

Q. Okay. How about the -- Why is it called an associated pool?

A. Well, to my understanding, the Queen is -- in this area -- There's several sort of connotations of the Queen. The Queen in this area, there's one lobe of it that's known as upper, middle and lower Queen. There is another lobe of it that is included in the Queen Associated that some people call the Penrose; other people call it the

lower Queen.

What we are seeking to unitize is from the top of the upper Queen to the base of the Penrose or the lower Queen. So the entire interval in this area is known as the Queen Associated, regardless of how you determine the three or four different horizons.

Q. So does this pool have any associated gas wells in it?

A. It possibly has one, and that would possibly be the -- Tract 9B, well number 1. That well --

Q. So if it has one, it's included in the unit?

A. Yes, sir.

Q. And it will be a part of the unit?

A. Yes, sir. That well originally produced at a higher gas/oil ratio than statutorily is an oil reservoir, but since that time it has -- Well, it currently is producing as a low-ratio oil well.

Q. And which one was that? I didn't --

A. In tract 9B, which would be the northwest quarter of the southwest quarter of Section 23. It's also known as the Mewbourne Oil Company Federal F Number 1.

Q. Possibly associated -- possibly had been associated --

A. Yes. It is not an associated well now.

Q. And there's not any others there?

A. Not to my knowledge.

Q. The 21 tracts -- Was it 21 tracts?

A. Yes, sir. Now, some of those are subdivided as A, B, C and D. If you'll hold on just one minute --

Q. Are they listed here, somewhere in here?

A. Well, in the unit agreement or plan of unitization, Exhibit -- Please turn to Exhibit B to start with, and that's the one we referred to prior. Do you have that?

Q. I don't have yet, but -- There we go, yeah.

A. That's after page 50.

Q. Yeah.

A. You're looking close, right there.

Q. Okay.

A. All right. The information that is shown on Exhibit B in the left column is unit, tract and well name, and there you will see the tract number 1, 2 a 3A, on the next page a 3B, 4, 5, 6A through 6B, 7, 8, 9A, 9B and on through 14.

Let me further define what each one of those are. Each numerical tract number is a separate BLM lease. Where there has been a subdivision by an alphabetical indication, that is where various farmouts and overriding royalties may differ.

Q. Okay, so there's 14 BLM leases?

A. Yes, sir, that is true.

Further, for your information, just so you can -- The question hasn't been asked, but I further ask that you turn to Exhibit C, which is the very next exhibit behind that in the book.

That has the same information as the left column in Exhibit B and the right column in Exhibit B, with the addition of unit participation of each one of the tracts as the rightmost column of -- in Exhibit C.

Q. Are these exhibits the same as the ones that were furnished to us prior to the hearing --

A. Yes, sir.

Q. -- or updated versions of those?

A. Yes, sir.

Q. So this material here, we can probably put that somewhere else?

A. I beg your pardon?

Q. The file is getting pretty thick. I was wondering if we could dispose of these.

A. Yes, you may.

Q. Return them to you or something.

And what was the participation formula again?

A. The participation formula is based on 95 percent ultimate primary recovery, plus 5 percent dedicated acreage. That will be further explained by engineering

testimony.

Q. And just a single-phase formula?

A. Yes, sir.

Q. And the percent of the working interest and royalty interests who have agreed to it are -- Has that been updated in here with the letters --

A. It is in -- Yes, sir, the exhibits that you have that are designated as Exhibit 3 and Exhibit 4 are accurate as to the representation of voluntary joinder into the unit.

Q. As of these letters that you presented here today?

A. Yes, sir. Those letters, as I said, they're only working interest owners. You won't find them in the book. You must add them to the book. We got them too late to perforate and insert into the book.

Q. And all the royalty interest you talk about is overriding royalty, with the exception of the BLM; is that correct?

A. Yes, sir. The BLM is the only actual royalty owner. All of the rest of the members of this proposed unit that we have cited are overriding royalty interest owners.

Q. And what is their interest? Is it generally an eighth, or is it more than that or --

A. The BLM, for the most part, are one-eighth leases. There are -- I believe there may be one or two Schedule -- Hold on just a minute. One...

There are four leases that are designated Schedule B under the basic royalty and percentage, and those are sliding-scale royalties for the BLM.

As far as the overriding royalties, in the second to the right column of Exhibit B is a detail of all outstanding overriding royalties, in addition to the basic royalty or sliding-scale royalty of the BLM. That's in Exhibit B, second to the right column.

Q. What is the working interest figure out across the whole unit?

A. The net revenue, the weighted average net revenue interest? That is approximately 78 percent net revenue interest after BLM royalty and overriding royalty interests.

I might add for your information again -- I believe the question has not been asked, but I believe there's only two of these leases that have not qualified under the reduced royalty rate that is now being allowed by the BLM.

Q. At a certain low level they're stripper level --

A. They're stripper royalty rates, yes, sir.

Q. The overhead rates were $4600 if you drill a

well, and what was the monthly rate?

A. $511 for a normal monthly producing rate.

Q. And do you plan to drill some wells?

A. There is a potential for drilling wells in this area, yes, sir.

Q. And was that drilling rate, was it also lower than the *Ernst and Young* rate, or was it higher?

That's all right, I can --

A. I don't recall that. This is -- Like I said, this is a rate that was agreed upon by the various working interest owners that -- the 97 percent that have approved the unit.

Q. Well, you indicated $511 was lower than the monthly rate in the survey. I believe you did, didn't you?

A. That is true. And I repeat, the way I arrived at that was the weighted average of all wells that came into the unit, whether it be Mewbourne wells, Anadarko wells or what other wells we might have bought. Mewbourne Oil Company has bought several of these wells from independent operators.

And whatever the rate was that was used in previous joint operating agreements, plus the wells that we operated, plus Anadarko's wells, was taken as a weighted average across the entire field. There was obviously some that was higher than $511, there was some that was less

than $511.

Q. And I believe you furnished a letter, BLM has agreed to -- tentatively agreed to --

A. Yes, sir, that is called their letter of designation upon approval of the New Mexico OCD of the proposed unitization. Then they will file a letter of certification.

Q. Did they suggest any of those changes that were included in your list of amendments?

A. No, sir, they did -- they -- Let's see. No, they did not. I was thinking about something that happened in the Bone Spring Unit, but not in the Queen Unit.

EXAMINER MORROW: Okay. Anything more?

MR. CARROLL: I don't have any.

EXAMINER MORROW: Thank you, Mr. Calvert, appreciate your testimony.

Do you have anything more to be introduced?

MR. BRUCE: Not of Mr. Calvert, no.

EXAMINER MORROW: Okay, all right.

KEVIN MAYES,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Will you please state your name for the record?

A. Yes, my name is Kevin Mayes.

Q. And where do you reside?

A. I reside in Tyler, Texas.

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

A. I'm a petroleum engineer in the employ of Mewbourne Oil Company.

Q. Have you previously testified before the Division as a petroleum engineer?

A. Yes, I have.

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

A. Yes, they were.

Q. And are you familiar with the engineering matters related to this proposed unit and the waterflood for the unit?

A. Yes, I am.

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

EXAMINER MORROW: All right, we accept Mr. Mayes.

Q. (By Mr. Bruce) Mr. Mayes, will you start off by referring to Exhibit 10? Identify it for the Examiner and discuss the unitized formation.

A. Yes, I can. Exhibit 10 is a type log from Mewbourne Oil Company's Federal "E" Number 7 Well, located in Unit A of Section 27, Township 18 South, Range 32 East.

The intervals into which we plan to inject water are the Queen and Penrose sands, the top of which is encountered at a depth of 3886 feet and the base of which is encountered at a depth of 4222 feet.

The unitized formation will include all subsurface points throughout the unit area correlative to these depths. This formation is designated by the Division as the Querecho Plains-Queen Associated Pool.

Q. Let's refer to Exhibit 11, and could you discuss the continuity of the unitized formation?

A. Exhibit 11 is a structural cross-section of the Queen Associated Pool, and the formation is continuous across the proposed unit area.

Also, this cross-section demonstrates how flat the structure is throughout the unitized area. The dip never exceeds five degrees.

Q. Mr. Mayes, let's then move on to Exhibits 12 and 13, and maybe address in a little more detail the Hearing Examiner's question of Mr. Calvert about the areal extent of the pool and what portion of the pool is being unitized.

A. Okay. Yeah, I'll start off by saying I did check the proration schedule, and all the wells that are classified as Querecho Plains-Queen are included in this unit area.

Q. Okay.

A. Exhibit 12 and 13 are the net thickness isopachs for the Queen and Penrose sands. The reservoirs are defined areally by porosity pinchouts and a water-oil contact along the southeast edge of the Queen sand.

Q. Does the unitized area in essence cover the entire pool?

A. Yes, it does.

Q. Let's move on to your Exhibit 14 -- I guess 14 and 15 together, Mr. Mayes -- and would you identify those for the Examiner and describe the production history from this pool?

A. Yes, I will. Exhibit 14 is a plat showing the development of the pool. The first completion and commercial production occurred in July of 1972. There have been 27 commercial completions in the unitized formation within the unitized area to date, and the spacing for the oil wells is 40 acres.

Exhibit 15 is a plot of the oil, water and gas historical production for the combined unit wells.

Oil production reached a maximum of 12,000 barrels per month in August of 1983. Production then declined at a 60-percent nominal rate on a harmonic trend. The trend corrected in late 1985, due to the completion of the Cavalcade Number 1 and Number 4 Wells.

The unit returned to its decline until July of

1988 when the decline was arrested and became flat due to energy entering the reservoir from three apparent sources, and I'll discuss these sources later.

Cumulative production through May of 1993 was 747,000 barrels of oil and 1.5 BCF of gas.

The drive mechanism of the pool is solution gas drive, with the exception of the three previously mentioned energy sources.

The reservoir pressure declined from a virgin pressure of 1600 p.s.i. to an estimated 280 p.s.i. The current GOR for the unit area is 1000 standard cubic feet per stock tank barrel.

We estimated that there was essentially no primary oil remaining as of May, 1993.

Q. Now, you mentioned three energy sources. Would you refer to Exhibit 16 and describe what they are?

A. Exhibit 16 is a plat showing the location where energy has apparently entered the reservoir over its history.

First, a casing leak was documented in the Marshall Federal Number 1 Well, Unit J, Section 23. When this well was shut in, in September of 1987, a response in offset producers is evident.

The casing leak was repaired in July of 1990 and responding wells have returned to their decline. So there

was apparently almost three years of dump-flooding associated with that well.

A second small lease flood operated in the southwest quarter of Section 27 from November of 1976 to March of 1986. When the last producer of this flood was shut in, in January of 1988, the decline of the north offsetting producers was arrested and flattened out. The only explanation appears to be that energy escaped from the mentioned lease flood.

And a third, Gary Bennett received Division Order Number R-9240 for a pressure maintenance project on the 80-acre Cavalcade lease of Section 21. Injection started in the Cavalcade Number 4, Unit P of Section 21 in late 1990, and response in the west offset is evident.

Anadarko Petroleum Corporation then acquired Bennett's operations and applied to expand the pressure maintenance project over to Section 22 and received Administrative Order Number P-MX Number 175 in October of last year.

At that time, Mewbourne approached Anadarko to unitize the entire pool. And after numerous correspondence and the aforementioned operators' meeting, Anadarko abandoned their expansion and requested that all their properties and their pressure-maintenance projects be incorporated into this unit.

Q. So on that administrative expansion that Anadarko got, there was no additional water injected?

A. That's true. They never did convert a well.

Q. And you mentioned the first energy source over in Section 23. At the time of that casing leak, do you recall who operated that well?

A. Marshall Federal. That was Esperanza --

Q. Okay.

A. -- out of Fort Worth.

Q. So it was not Mewbourne?

A. No, it was not.

Q. In your opinion, is the unit area in an advanced state of depletion with respect to primary production?

A. Yes, the current pool averages two barrels of oil per day per well.

Q. And has the pool which you intend to unitize been adequately defined by development?

A. Yes, it has.

Q. Is this portion -- Or is the pool suitable for unitization and waterflood?

A. Yes, it is.

Q. Could you then move on to Exhibit 17 and discuss for the Examiner how you projected production for the Querecho Plains-Queen Associated Pool under your proposed waterflood conditions?

A. Yes, Exhibit 17 is a plat showing the location of two offset Queen waterfloods, the Pearsall and the Young Queen Units. The production trends from these waterfloods were used to determine our projection.

Q. Okay. And referring to Exhibits 18 and 19, what have been the results of these offset waterfloods?

A. Okay, Exhibits 18 and 19 are the historical production trends from the two offsets. The Young Unit utilized a peripheral pattern, and the Pearsall used a fivespot pattern.

It can be seen that both floods met with similar results in that peak rate was obtained at similar times following start of injection and the secondary-to-primary recovery ratios calculated at approximately three-quarters of a barrel of secondary oil per every barrel of primary oil.

Q. What injection pattern does Mewbourne Oil Company propose using? And I refer you to Exhibit 20.

A. Exhibit 20 is a plat showing the locations of our initial injection wells for the unit. The proposed pattern is a modified peripheral.

Q. And referring to Exhibit 21, how do you predict performance of this waterflood?

A. Exhibit 21 is a plot of the projected production for our unit under waterflood operations. This projection

is derived from the performance of the two offset analogies.

Q. Would you briefly discuss the economics of your proposed waterflood? And I refer you to your Exhibit 22.

A. Exhibit 22 is a summary of the project economics. It's shown that the capital investment for the project is $592,000. The incremental reserves will generate approximately $580,000 net revenue to the working interest owners, a return of investment of 2.4 to 1, and an internal rate of return of 29 percent. The present worth, discounted at 10 percent, is $470,000 with a discounted return on investment of 1.8 to 1.

I might note that these economics do have the BLM's stripper royalty reduction rate and the State's severance tax incentives taken into account.

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

A. Yes, it will.

Q. And what is the estimated life of your waterflood?

A. Approximately five and a half years.

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

A. Yes, it is.

Q. And is your waterflood application economically

and technically reasonable at this time?

A. Yes, it is.

Q. Will your waterflood operations in the pool prevent waste and result with reasonable probability in increased recovery?

A. Yes, it will.

Q. And will the recovery produce substantially more hydrocarbons from the pool than would otherwise be recovered?

A. Yes, it will.

Q. Will the unitization and secondary recovery benefit the working interest owners and the royalty interest owners?

A. Yes, it will.

Q. Mr. Mayes, let's move on to the injection application itself. Would you identify Exhibit 23 for the Examiner?

A. Yes, Exhibit 23 is New Mexico Oil Conservation Division Form C-108 with its attachments, and this was submitted with our Application.

Q. Will you please go through this page by page or section by section, beginning with -- I think you've numbered the pages, Mr. Mayes?

A. Yes, I have.

Q. Referring to the page numbers, would you first

discuss your proposed injection wells?

A. Yes. Pages 2 through 11 of the C-108 are schematics of all of our proposed injection wells. The mechanical integrity of all the proposed injectors appears to be adequate.

The first schematic, on page 2, is the already-existing injector, Cavalcade Number 4.

And then if I could refer the Examiner to page number 3, there are notes at the bottom of page number 3 that describe how the top of cement was calculated. Throughout the C-108, the top of cement is calculated using appropriate cement yields, a 25-percent reduction to that yield with no consideration given to casing collars.

It is our intention to set a packer within 100 feet of the top perforation and use non-coated tubing. And we have a number of reasons for requesting non-coated tubing, beyond the fact the initial cost is substantial.

First, the Bone Spring unit that we've discussed is going to provide the water for this Queen Unit.

Q. This is the Querecho Plains-Bone Spring Unit?

A. That's correct, the Querecho Plains-Bone Spring, in that the facilities and the water injection system for that Bone Spring waterflood are already in place and geographically overlie the same area as this Queen unit will lie.

We've had that Bone Spring injection system in place for six months now, and just pulled our first corrosion coupons out of that water injection system, and the corrosion rate was measured at 1.2 mils per year, which is an exceptionally low corrosion rate.

Second, we will set a packer 100 feet within the top perforation and have packer fluid circulated into the tubing and casing annulus on all these injectors, so we will have a means for monitoring. Should there be a tubing leak at any time, we will have immediate monitoring of that, and we will repair that tubing leak immediately.

Third, the Division approved a non-coated tubing for the Querecho Plains-Bone Spring Unit, in that we presented the waters would be noncorrosive with this water system. As a result, in that we have low corrosive water and that we have a means to immediately monitor if there is a tubing leak of any kind with our injection wells, and that the Queen is going to have a short waterflood life, we would request that the Division approve non-coated tubing for this Queen Unit.

Q. Now, keeping Exhibit 23 in front of you, but also adding Exhibit 24, Mr. Mayes, could you identify that exhibit and discuss the wells in the area of review?

A. Yes, I can. Exhibit 24 is a plat showing the area of review, which is a one-half mile radius around all

the injectors.

Also on that Exhibit 24, posted in the tan circles, is the location of all wells that have tested potential freshwater sources in the area.

Shown on Exhibit 24 is the area of review, with the names of all leasehold operators and the location of all freshwater wells, as supplied by the New Mexico State Engineer's Office.

The half-mile circle around the Cavalcade Number 4 Well is dashed, as it is already approved for injection.

Then I'll refer the Examiner back to the C-108, and in particular pages 13 through 17. Those pages contain a spreadsheet list of all the mechanical information for the wells located within the area of review which penetrate the unitized formation.

Three wells in that spreadsheet list do not have the calculated top of cement covering the Queen horizon on the production casing. However, the intermediate strings of casing on those three wells do cover all the potential freshwater sources and do have cement circulated to surface behind those strings. As a result, any Queen injection will be isolated from freshwater sources.

Again, a similar situation arose with the Bone Spring Unit, in that the top of cement did not cover the targeted injection zone in an offset well, and the Division

approved of monitoring whether fluids were leaving the injection zone and communicating up and down the annulus behind that production casing.

They approved that, provided that we as the operator ran an annual temperature traverse across the zone to see if there was a cooling anomaly which might be moving up the hole in those wells, and also by monitoring the annular pressure between the production casing and the intermediate casing up at the surface valve.

So we would again ask that the Division approve of monitoring these three wells in such a manner for the Queen Unit.

Q. Are there any plugged and abandoned wells in the area of review, Mr. Mayes?

A. Yes, there are. Page 18 through 32 of the C-108 contain schematics of all the plugged and abandoned wells. The mechanical integrity of these wells will isolate any Queen injection from any potential freshwater sources.

Q. And to the best of your knowledge, is the mechanical integrity of all the wells in this area sufficient to conduct waterflood operations?

A. Yes, I believe them to be.

Q. Would you please discuss your plans for reworking your proposed injectors?

A. All the proposed injectors are all currently

producing and will require removal of pumping equipment. We again plan to install a packer within 100 feet of the top perforation and circulate an inert fluid into the tubing casing annulus.

All injectors will receive acid treatments during their conversions, and all injection wellheads will have pressure gauges installed on the tubing and casing annuluses.

Q. We've already gone over this briefly, but could you describe what additional facilities Mewbourne Oil Company will need to install for the unit and the waterflood?

A. Okay. Very few additional facilities are planned. The injection water, again, will be obtained from the already-in-place injection system that's associated with the Querecho Plains-Bone Spring waterflood. This will require laying a minimal amount of injection lines, tying into the Bone Spring system and just laying over to the Queen injectors.

Pressure regulators will be installed so that we can control the injection pressures going from the Bone Spring lines to the Queen injectors. And production facilities will remain essentially intact by utilizing three satellite tank batteries, and all flow lines will be rerouted accordingly.

Q. What injection pressure do you request approval on?

A. We're requesting a maximum injection pressure of 1400 p.s.i.

Q. Would you refer to Exhibit 25 and discuss the basis for this request?

A. Yes, Exhibit 25 contains calculations showing that the frac gradient will not be exceeded with 1400 p.s.i. of surface pressure.

Q. Are there any freshwater sources within a mile of the proposed injection wells?

A. Yes, two shallow zones in the region are considered capable of producing fresh water, even though no wells in the area do so. These are the triassic red beds and the alluvium. Again, they are posted back on Exhibit 24 -- the four wells which tested these zones are posted on Exhibit 24.

Again, none of our injection water should reach these freshwater sources.

Q. Are there any faults or any other hydrologic connections between freshwater sources and the injection formation?

A. After reviewing the geology for two miles around the unit, there appears to be no faulting, and with all wellbores having good mechanical integrity we do not see

any hydrologic connection to any freshwater sources.

Q. Is the injection water compatible with the formation water?

A. Yes. Provided on pages 36 through 41 of the C-108 is an analysis of all the waters to be used as injection. That is a report that was prepared by a certified laboratory, and it indicates minimal compatibility problems exist between the waters.

Q. Is the unitized management, operation and further development of this pool necessary in order to effectively carry on secondary recovery operations?

A. Yes.

Q. And will it substantially increase the ultimate recovery of oil from the unitized formation?

A. Yes, it will.

Q. In your opinion, does the unit agreement provide for a fair and equitable plan of unitization?

A. Yes, it does.

Q. Now, the unit agreement was submitted as Exhibit 2. Could you describe how production will be allocated among the various tracts under the unit agreement?

A. Yes. Article 7.1 on page 21 of the unit agreement sets out the participation formula to be used for allocating production. Definitions for all the variables in the formula are supplied in the definitions section of

the unit agreement. The formula, again, is 95 percent ultimate primary production and 5 percent surface acres.

Q. Does the participation formula contained in the unit agreement allocate the produced and saved hydrocarbons to each tract on a fair and equitable basis?

A. Yes, it does.

Q. And what is the initial project area for the waterflood?

A. The initial project area, pursuant to Division Rule 701-G-3, will encompass 1080 acres, all located inside the unit boundary.

Q. And what project allowable do you request?

A. Mewbourne would request that each producing well be granted an allowable equal to its capacity to produce.

Q. And do you request that the order in this matter contain an administrative procedure for approving unorthodox well locations and for changing producing wells to injection wells?

A. Yes, Mewbourne's proposal is submitted as Exhibit 26.

Q. Was notice of the waterflood application mailed out as required by Form C-108 to offset operators?

A. Yes, it was.

Q. And is Exhibit 27 your affidavit of notice?

A. Yes, it is.

Q. What is Exhibit 27A?

A. 27A is a public notification that was published in the *Lovington Daily Leader*.

Q. And that was just to cover all the bases?

A. That's correct.

Q. In your opinion, will the granting of this Application be in the interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes, it will.

Q. And were Exhibits 10 through 27A prepared by you, under your direction, or compiled from company records?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, at this time I would move the admission of Exhibits 10 through 27A.

EXAMINER MORROW: 10 through 27A are admitted into the record.

EXAMINATION

BY EXAMINER MORROW:

Q. Let's see, the waterflood cost is $500,000 or $582,000 or --

A. $592,000, yes, sir.

Q. And I believe your exhibit showed that at a 10-percent rate of return, the value was less than that; is that correct?

A. No, sir, there's a 29-percent internal rate of return on the project.

Q. Well, I've got another note on that.

On Exhibit 14 there were some connecting arrows that went across the unit line. What was the significance of those?

A. That is a lease -- We call it a lease hook line. Basically, where there's an arrow there, that is an entire lease.

So for example, are you looking at that exhibit or --

Q. I remember it.

A. You remember it. Where there was a lease that was broken up, some of it was brought into the unit, some of it was left out. We've put a lease hook arrow to identify the entire lease.

Q. Okay. Let's see, the -- Would this -- If an order is issued in this case that would authorize what you requested, would that supersede that R-9240 and the P-MX 175?

A. I would refer that question to my counsel.

MR. BRUCE: Yeah, I think it would, Mr. Examiner, it would supersede that.

EXAMINER MORROW: Okay.

MR. BRUCE: 9420 was a pressure maintenance -- a

one-well pressure maintenance project itself. We would ask that it supersede that order.

Q. (By Examiner Morrow) Okay, that was Exhibit 22 where you had your economics summarized, I believe.

A. That is correct.

Q. And what is that? Present worth discounted at 10 percent working interest --

A. Yes.

Q. -- total group, it says $480,000.

A. Right.

Q. What does that mean?

A. If we take the cash flow to the working interest owners as a group and we discount that cash flow at a 10-percent discount factor --

Q. Yes, sir.

A. -- their present worth value is $480,000.

Q. Oh, the future cash flow?

A. That's correct.

Q. So the present worth, then, to the working interest owners would be less than the cost of investment; is that right?

A. No, that includes their capital. So that -- They pay their capital, they get a cash flow, and all of that taken into account, they receive $480,000 of present worth.

Q. In addition to receiving their money back?

A. Their capital back, that's correct.

Q. Okay. The Bone Spring water will be used, I believe you said, for injection water?

A. That's correct.

Q. Will that be from the Bone Spring flood --

A. No, there's a -- There are essentially four sources that make up the water that goes to that Bone Spring waterflood.

The bulk of the water comes from the City of Carlsbad's Double Eagle system, which is essentially a freshwater -- It's a 5000-part-per-million-dissolved-solids-type water.

And then the rest of it would be Bone Spring-produced water, and we pull in Delaware-produced water from operators in the area, and then also Queen-produced water.

Q. But you indicated you thought that would be noncorrosive, all that mixture of water?

A. Right. Like I say, we are currently mixing those waters together, and we have been running that Bone Spring waterflood system for six months. And we pulled our first set of corrosion coupons out of there, and those corrosion coupons are recording at the 1.2-mil-per-year corrosion rate.

Q. And you'll be using essentially the same water you're using at the moment?

A. Exactly.

Q. And is the tubing coated in the Bone Spring?

A. No, it is not.

Q. And how long will the waterflood be? You indicated it would be short.

A. Yeah, the Queen waterflood is five and a half years. The Bone Spring is on the order of 12 to 14 years.

Q. Now, those three wells that aren't cemented across the Queen, are any of those the same wells that were involved with the Bone Spring flood?

A. Well, as a matter of fact, all three are producers in that Bone Spring waterflood.

The situation that came up with the Bone Spring unitization was, an offset Morrow gas well did not have the top of cement covering the Bone Spring injection zone. As a result, we offered testimony that we did not feel Bone Spring water would escape the Bone Spring zone in that Morrow gas well.

In this situation, these Bone Spring producing wells don't have the cement covering the Queen, and we submit that we do not feel that Queen injection water will leave the Queen zone in these three Bone Spring producers.

Q. Are they within the unit -- Queen unit --

A. Yes, they are.

Q. -- boundary?

A. Yes, they are.

Q. Do you have them identified on any of the plats?

A. No, I do not, but I could identify them for you real quick if you would like for me to.

Q. All right. Well, here's Exhibit 24. Let's put them on Exhibit 24.

A. Okay, the first one will be in location Unit E of Section 23.

Q. All right.

A. In other words, the southwest of the northwest.

Q. Uh-huh. Tract 13 there?

A. Tract 13, that's correct. It's that Murjo Number 1.

Q. Okay, and that well is operated by Mewbourne?

A. That well is a Bone Spring operated by Mewbourne Oil Company under the unitization of the Bone Spring.

A. And is it identified in your C-108?

A. Yes, it is.

Q. Okay.

A. And I'm going to have to take back what I said. The other two wells are outside the unit boundary. My mistake. I thought they were inside.

But those two wells are in Section 26, Units E and F, identified as Sprinkle 3 and Sprinkle 4.

Q. Okay. Are those operated by Mewbourne?

A. The Sprinkle 3 is a Bone Spring producer operated by Mewbourne in the Bone Spring unit.

The Sprinkle Number 4 is actually a Delaware producer operated by Santa Fe Energy.

Q. The 3 is a Mewbourne well?

A. That's correct.

I might add that these wells were discussed at length during the Bone Spring testimony, and the Division order that was issued for the Bone Spring injection was R Number 9737A, for your reference.

Q. Well, why would the Delaware well have been discussed there as one that doesn't have the Bone Springs covered with cement?

A. I don't follow your question.

Q. Well, I understood that -- Are you saying that these were discussed because the zone to be flooded was not cemented behind the pipe?

A. The mechanical details of these wells were presented at that testimony. Of course, the mechanical detail is also included in the C-108 of our current Application, so --

Q. Well, I guess my point is, it's different now since you're injecting into a zone --

A. Right.

Q. -- above the Bone Spring, above the Delaware.

A. Right, I understand. I'll refer you to the mechanical detail on our C-108 then.

Q. Would San Jose be agreeable to the tests that you propose to run on their well and the monitoring and --

A. I have not contacted them about that. I would think they would be more amiable to monitoring that situation versus re-entering the well to squeeze it, yes, I would think so.

Q. I agree with that.

On the plugged and abandoned wells, start on page 18 there, please, sir --

A. Okay.

Q. -- C-108. Approximately what would the injection interval into the Queen be, in your flood?

A. Depthwise?

Q. Yes, sir.

A. It will be that -- the 3800 feet to 4200 feet, as outlined with Exhibit 10.

Q. So on this 18 it would be between -- Some of it, at least, would be probably between those two plugs at 4150 and 1500?

A. That's correct.

Q. Now, that's an open-hole interval there. Did you propose any replugging in this well?

A. No, sir.

Q. And what would be open there, to injection? If injection did communicate into this well, what would it -- what formation would be exposed?

A. There is -- I know of formations identified as the Yates and Seven Rivers that are shallower horizons to the Queen. The tops of those formations I do not have available to me right now, but those are known producing strata in the area.

Q. Okay, and they're not included in the unitized --

A. That's true.

Q. They're not?

A. That's right.

Q. Okay. It looks like probably 20 and -- on page 20 and 23 and 24 and 25, a similar situation would be in place there in those wells; is that --

A. That's correct.

It's our opinion, Mr. Examiner, that that mud that is left in those wellbores is sufficient either due to the hydrostatics of the mud or the properties of the mud after it's settled and it's stayed in those wellbores a given time frame, that under the pressures that we'll be injecting into the Queen and Penrose, that we do not see any water escaping the Queen zone due to those mud columns. We feel like the properties of the mud are such that our injection will not leave our formation, due to those

wellbores.

Q. Okay. I believe you stated once that all injectors are currently producing. I believe one of the wells, at least, is an injector at present, is it not?

A. Yes, that's true.

Q. And is there only one --

A. That's true, yes. Yeah, the Cavalcade in Unit P of Section 21 is currently injecting, that's true.

Q. And that's operated by Anadarko?

A. By Anadarko, that's correct.

Q. Do you know how much water they're putting in there now?

A. It's about 100 barrels a day.

Q. And how long have they been putting water in there?

A. They started injecting in late 1990, December of 1990.

Q. And anywhere in here did you show us how much water they put into that well?

A. No, sir, and I don't have that figure available to me right now.

Q. Okay. You have it --

A. I have it in my notes.

Q. If you would send that to us, we'd appreciate it.

A. I certainly will.

Q. Now, on the performance curve for the pool -- I'm assuming it was fieldwide --

A. Yes, sir.

Q. -- did it -- were there any indications of response to the injection in the south part of 27?

A. Yes, as I gave testimony to, whenever they shut that flood down in Section 27, the two producers that are offset to the north --

Q. Those two in tract 7? Is that the two?

A. No, the two in tract 6D, the five wells that are in the southwest quarter of Section 27 --

Q. Uh-huh.

A. -- were all part of this little lease flood, and they shut all five of those wells down. And when they shut those wells down, the producers in units E and F of Section 27 had their decline arrested and their production flattened out.

Q. Was that noticeable on the curve? You probably pointed that out, but I don't guess I picked it up if you did.

A. Yes, I did point it out in my testimony, yes.

Q. Okay. Well, go ahead. What exhibit is that, the performance curve?

A. Well, I'd refer you to Exhibit 15 --

Q. Okay.

A. -- which is the curve for all the wells in the unit.

Q. Right.

A. But you can see where the production was -- decline was arrested and the oil production became flat.

Q. What date is that?

A. The last well in that lease flood was shut in in January of 1988.

Q. Okay. Now, the other outside energy source was the casing leak; is that right?

A. That's right.

Q. And was there any more injection, other than this in 27 and 21?

A. No, there was not.

Q. Okay. And is there a kick on this curve due to the injection into 21?

A. 21, yes.

Q. Where is that?

A. Basically, if you look at the end of 1991, oil production increases a little bit.

Q. Okay. On 1400 p.s.i., how much does that -- That would be about 3/10 of a pound per foot or -- that you're asking for?

A. That should be on that Exhibit 25. You're figuring the surface gradient?

Q. Well, yes, sir, I guess it would be about 1400 over 4100, something like that.

A. Uh-huh. That's what it would be.

Q. 1400 is what you're asking for?

A. Yes, sir.

Q. And the basis for that is these initial shut-in pressures; is that --

A. Initial shut-in pressures from frac jobs pumped to the field, yes.

Q. What does that initial shut-in pressure tell us?

A. Well, that is the propagation pressure for a frac in those zones.

In other words, that is the pressure that when the pumps shut down on the frac job and the friction due to the perforations in the tubing has dissipated, that initial shut-in pressure is equivalent to the true frac pressure of the formation.

Q. So you're backing off from that some?

A. Right.

Q. Do you know what the injection pressure is on the current injection well in Section 21?

A. I do not know what they were approved of in their Division order. I know they run about 950, 1000 pounds.

Q. They do now?

A. Yes, sir.

Q. Mewbourne does not operate that well at present?

A. That's right. That's Anadarko.

Q. Okay. Do you think they would be agreeable to some step-rate tests on that well?

A. Well, the reason we prefer using the ISIPs to a step-rate test at this time is that the fracture plane is already established in the wells, and the proppant is in place in the frac plane, and our concern is if we do step-rate tests and we prop that frac back open, our proppant may settle out of our frac job and cause damage to the well.

Q. Is that true of the well in Section 21?

A. Yes, sir.

Q. It's been frac'd?

A. Yes, sir.

Q. You said the initial project area is 1020 acres. What acreage does that include?

A. That's 1080 acres.

Q. -- -eighty.

A. According to the statutes, the project area is all the units that have an injection well on it or surrounded by an injection well -- surrounding an injection well that has a Queen producer on it.

So I took all the injectors and then all the surrounding 40-acre proration units that have wells on it,

and that comes up again to 1080 acres.

Q. And what is total unit acreage again?

A. 1520 acres.

Q. So the initial project area is all of the injection you show here --

A. Right.

Q. -- on Exhibit 24?

A. Basically, the difference in the acreage is essentially development locations within the unit area.

EXAMINER MORROW: Do you have anything to ask?

MR. CARROLL: No.

EXAMINER MORROW: Thank you, sir, I appreciate it.

THE WITNESS: Thank you.

MR. BRUCE: I have just a couple more questions.

EXAMINER MORROW: Okay, excuse me.

MR. BRUCE: A couple questions, just to clarify something.

FURTHER EXAMINATION

BY MR. BRUCE:

Q. Mr. Mayes, you mentioned the Sprinkle Number 4 Well, I think it was, and you said it's a Delaware. That was originally a Bone Spring producer?

A. That's correct, Santa Fe recompleted that uphole recently.

Q. And what is the weighted average Queen reservoir pressure?

A. Currently?

Q. Yes.

A. Well, before these energy sources started leaking into the reservoir, we estimated it at 280 p.s.i. It's probably increased slightly from that.

Q. And what do you estimate --

A. Is that -- Excuse me, I didn't understand. Was that Bone Spring pressure or Queen?

Q. Queen.

A. Queen.

Q. What do you estimate it will be after the flood is instituted?

A. The way we operate a waterflood is, we will target the pressure to get back up to the original reservoir pressure, which was 1600 p.s.i., and we will then balance voidage where we will keep that pressure at 1600 pounds.

Q. Okay. And you were discussing with the Examiner the various wells. Would that pressure indicate that the hydrostatic head of the mud would be sufficient to prevent migration?

A. That's correct, that's where the Examiner and I discussed that the mud properties of those plugged and

abandoned wells should be sufficient to hold our injected fluids in our targeted intervals, that's correct.

MR. BRUCE: Thanks, Mr. Mayes. I have nothing further.

EXAMINER MORROW: Thank you.

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

EXAMINER MORROW: All right, Cases 10,959 and 10,960 will be taken under advisement.

(Thereupon, these proceedings were concluded at 10:57 a.m.)

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CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL May 11th, 1994.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1994

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 _____ 19____.

_____, Examiner
Oil Conservation Division