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 NO. 12,638
APPLICATION OF TEXACO EXPLORATION AND PRODUCTION, INC., FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT FOR ITS NEW MEXICO "O" STATE NCT-1 LEASE AND ITS STATE "BA" LEASE, LEA COUNTY, NEW MEXICO	)	ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

April 5th, 2001

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, April 5th, 2001, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

April 5th, 2001
Examiner Hearing
CASE NO. 12,638

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E X H I B I T S

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A P P E A R A N C E S

FOR THE APPLICANT:

HOLLAND & HART, L.L.P., and CAMPBELL & CARR
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P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: WILLIAM F. CARR

* * *

WHEREUPON, the following proceedings were had at 11:35 a.m.:

EXAMINER CATANACH: At this time I'll call Case 12,638, the Application of Texaco Exploration and Production, Incorporated, for approval of a pressure maintenance project for its New Mexico "O" State NCT-1 Lease and its State "BA" Lease, Lea County, New Mexico.

Call for appearances in this case.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe office of the law firm Holland and Hart, L.L.P. We represent Texaco Exploration and Production, Inc., in this matter, and I have two witnesses.

EXAMINER CATANACH: Are there any additional appearances? Okay, will the witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

MR. CARR: Mr. Catanach, at this time we call Robert Martin.

ROBERT L.W. MARTIN, II,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your full name for the record,

please?

A. Yes, Robert Martin.

Q. Where do you reside?

A. 2813 Maxwell Drive in Midland, Texas.

Q. Mr. Martin, by whom are you employed?

A. Texaco.

Q. And what is your position with Texaco?

A. Geologist.

Q. Have you previously testified before this Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as an expert witness in petroleum geology accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the Application filed in this case on behalf of Texaco?

A. Yes.

Q. Are you familiar with Texaco's plans to implement a pressure maintenance project in its New Mexico "O" State NCT-1 Lease and its State "BA" Lease by the injection of water into the Abo, the Wolfcamp and the upper Pennsylvanian formations?

A. Yes, I am.

Q. Are you familiar with the status of the lands in

the area which is the subject of this Application?

A. Yes.

Q. Have you made a geological study of the area which is the subject of this case?

A. Yes.

Q. And are you prepared to share the results of this work with Mr. Catanach?

A. Yes, I am.

MR. CARR: Are Mr. Martin's qualifications acceptable?

EXAMINER CATANACH: They are.

Q. (By Mr. Carr) Mr. Martin, would you briefly summarize what it is that Texaco Exploration and Production, Inc., seeks with this Application?

A. Texaco is seeking an authorization to inject water into the Abo formation of the North Vacuum-Abo Pool, the Wolfcamp formation of the Undesignated Vacuum-Wolfcamp Pool, and the upper Pennsylvanian formation of the Vacuum-Upper Pennsylvanian Pool in its New Mexico "O" State NCT-1 lease and its state "BA" lease, located in portions of Section 36, Township 17 South, Range 34 East, in New Mexico, by way of three injection wells.

Q. Let's go to what has been marked for identification as Texaco Exhibit Number 1, and I would ask you, using this plat, to review for the Examiner the

current status of the acreage which is the subject of this case and identify the boundaries of this project area.

A. Okay. Yeah, the project area shows the acreage that we have in Section 36 of Township 17 South, Range 34 East, which are two state leases. The north half of the north half of Section 36 is our State "BA" Lease; the south half of the north half, the southeast quarter and the south half of the southwest quarter are part of our New Mexico NCT-1 lease.

It also shows some of the offsetting and also the wells -- only the wells that are deeper than 8400 feet, which covers part of the Abo, Wolfcamp and Pennsylvania, are shown on this map.

Q. The three injection wells are the wells inside the red circles; is that correct?

A. That's correct.

Q. How many acres are actually in the project area?

A. 560 acres.

Q. Are you aware of current plans by Texaco to add additional injection wells in the project area?

A. The only plans at this time are to convert the three wells to injection.

Q. Really, what we're looking here is a water injection, a pressure maintenance effort in the southern end of the Abo, and most of the Abo to the north is under

active waterflood or pressure maintenance; isn't that fair to say?

A. That's correct.

Q. Within this project area the ownership is what, 100 percent state land?

A. Yes, it is.

Q. Have your plans to implement a pressure maintenance project in this area been reviewed with the State Land Office?

A. Yes.

MR. CARR: Mr. Catanach, yesterday afternoon we received a letter from the Commissioner of Public Lands waiving objection to our plans to inject in these state leases. That letter is included in our exhibit packets out of order. It's the last document in the exhibit pack marked Texaco Exhibit Number 8.

Q. (By Mr. Carr) Mr. Martin, let's go to what has been marked Texaco Exhibit Number 2. Would you identify that for Mr. Catanach?

A. Yes, Exhibit Number 2 simply shows the other companies that are involved in this area that we had to send letters to, as far as what we're doing in the area with the pressure maintenance.

Q. And is Exhibit Number 3 an affidavit confirming that notice of this Application has been, in fact, provided

in accordance with the rules of the Oil Conservation Division?

A. Yes, it is.

Q. Has notice of the Application been provided to all leasehold operators within each of the areas of review for each of the three injection wells?

A. That's correct, yes, it has.

Q. Let's go now to the geological portion of this Application, and I would ask you to initially refer to the cross-section marked A-A' and review the intervals into which Texaco proposes to inject in this pressure maintenance project.

A. Yes, A-A' is a structural cross-section through the "BA" State Number 8, the "O" Number 39 and the "O" Number 38. And basically I just wanted to show the top of the Abo, the top of the Wolfcamp and the top of the upper Penn.

The bars that are in green in the depth track show the different perforations that we have for those three particular wells at this time.

Q. Would you go through each of these intervals, the intervals into which you propose to inject, would you go through each of them for us and provide general information on them, the depth, thickness, things of that nature?

A. Okay. Yeah, the first one will be the Abo

formation, which is part of the North Vacuum-Abo Pool. It's mostly dolomite.

The depth of the formation is approximately 7900 feet to 9200 feet, and the net thickness pay -- In this area we're only focusing in on the lower Abo, which is around 15 to 25 feet, average porosity four to five percent.

The Wolfcamp formation is mostly limestone with some dolomite stringers. The approximate depth is from 9200 feet to 9950. Net pay thickness varies anywhere from 150 to 200 feet. Average porosity can range anywhere in the pay from six to 14 percent.

And the last one is the upper Pennsylvanian, part of the Vacuum-Upper Pennsylvanian Pool. It's mostly limestone with dolomite stringers. Approximate depth is 9950 to 10,250, and the net thickness pay varies anywhere from 100 to 150 feet, with an average porosity in the pay of six to 12 percent.

Q. The other productive zones in this area are what?

A. We do have some shallower and deeper productive zones in the area, but none of them are in between the zones that we want to inject into.

Q. Let's go to Exhibit Number 5, and I'd ask you simply to explain what that is.

A. Five just simply shows the cross-section path and

all of the wells that are located within Section 36 of 17 South, 34 East.

Q. Okay, using this as an index map for the cross-section, now, let's go back to that Exhibit Number 4, and I'd ask you to review the remaining information on the cross-section A-A.

A. Basically, we just -- it is our opinion that most of these zones within the Abo, Wolfcamp and Pennsylvanian are continuous across this local area and would be a good candidate for waterflood project.

Q. Will Texaco call an engineering witness to review the engineering portions of this case?

A. Yes.

Q. Were Exhibits 1 through 5 prepared by you?

A. Yes.

MR. CARR: Mr. Catanach, at this time we would move the admission into evidence of Texaco Exhibits 1 through 5, which are the exhibits sponsored by Mr. Martin, and we would also ask that Exhibit Number 8, the letter from the Commissioner of Public Lands, be made a part of the record in this case.

EXAMINER CATANACH: Exhibits 1 through 5 and Exhibit Number 8 will be admitted as evidence in this case.

MR. CARR: And that concludes my direct examination of this witness.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Martin, to the north is the -- Is that the North Vacuum-Abo Unit?

A. That's correct.

Q. And that was a Mobil, wasn't it, or at one time?

A. That's correct.

Q. Who operates that now?

A. I believe Exxon Mobil does.

Q. And that's being flooded and produced in the same interval that you're proposing here?

A. No, most of theirs is a lot higher than ours. As far as what we're looking at in the Abo, it's in the lower portion at this point, which is just above the Wolfcamp, anywhere from 50 to 100 feet above the Wolfcamp.

Within the North Vacuum-Abo Pool itself to the north, they are flooding a lot more zones higher up.

Q. They're not flooding this particular zone?

A. To my knowledge, no.

Q. Is it nonproductive up there, or do you know?

A. I haven't looked at it. I don't know.

Q. Well, is the upper Abo zones not productive on your acreage?

A. I don't know.

Q. Why do you choose to just flood this lower Abo

zone, as opposed to some upper Abo?

A. At this point it's really the only thing that I've looked at hard in the way of rotary sidewall cores that we've taken in another well recently, and there is some question as to where does the Wolfcamp and the Abo actually lie? You get different operators who say the Wolfcamp may actually be a little bit higher, which would include what I call the lower Abo.

Q. These zones are pretty much continuous over your whole lease area?

A. That's correct.

Q. Is the -- I don't recall that the Wolfcamp or upper Penn are being flooded in this area.

A. To my knowledge, they are not.

Q. But you think there's potential for some pressure maintenance operations?

A. Yes, I do, and I believe Kevin Hickey could probably answer that a little better than I could, as to why.

Q. Do you know -- On your particular lease, do you know if Texaco owns 100 percent of the working interest?

A. On our particular lease, yes, they do.

Q. On both these state leases?

A. That's correct, on the three tracts that I know that we're going to be injecting into. I don't know about

any of the other leases offsetting that.

Q. Yeah, but on the State "BA" and NM "O" State there are no other interest owners?

MR. CARR: There are no other interest owners; it's 100 percent Texaco acreage.

EXAMINER CATANACH: Okay.

MR. CARR: And the royalty is State of New Mexico on both tracts.

EXAMINER CATANACH: Okay, I guess that's all I have for now.

MR. CARR: Mr. Catanach, at this time we call Kevin Hickey.

KEVIN HICKEY,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. Kevin Hickey.

Q. Where do you reside?

A. in Midland, Texas.

Q. By whom are you employed?

A. I'm employed by Texaco Exploration and Production, Incorporated.

Q. And what is your position with Texaco?

A. I'm a project engineer.

Q. Mr. Hickey, have you previously testified before this Division and had your credentials as an expert in petroleum engineering accepted and made a matter of record?

A. Yes.

Q. Are you familiar with the Application filed in this case on behalf of Texaco?

A. Yes.

Q. Are you familiar with Texaco's plans to implement a pressure maintenance project in the two State of New Mexico leases which are the subject of this hearing?

A. Yes.

Q. Have you made an engineering study of the area which is the subject of this case?

A. Yes.

MR. CARR: Mr. Catanach, we tender Mr. Hickey as an expert witness in petroleum engineering.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Carr) Mr. Hickey, initially could you explain to us why it is that Texaco seeks to implement this pressure maintenance project at this time?

A. Through the production of this field we have seen declining bottomhole pressures and increasing GORs, tending to indicate the depletion of the reservoir.

Q. Does Texaco plan to drill any additional wells in this area?

A. New drilling is unlikely, due to -- unless we have some type of implementation of a pressure maintenance project. We recently -- Our last well we drilled out there last year IP'd for about 60-some barrels a day and is producing about 40 barrels a day now, and that would be a marginally economic well.

Q. Let's go to Texaco Exhibit Number 6, and I would ask you to first identify that and then explain the information on that exhibit to Mr. Catanach.

A. I believe Mr. Catanach has a smaller version of this map, but I'm going to use a bigger map to work with. Basically this is a plat showing the productive horizons. I have three plats pretty much showing the same acreage.

The plat here, the first one with the blue dots on it, shows -- the blue dots represent cumulative production from the Abo formation, that's both the upper and lower Abo. And you can see from this that the Abo formation is probably the predominant producing horizon here.

As mentioned by Mr. Martin, there is some active waterfloods going on in the Abo formation. You have the North Vacuum-Abo Unit, which is operated by Exxon Mobil. There is a North Vacuum-Abo East Unit, also operated by

Exxon Mobil. There is a North Vacuum-Abo North Unit, which is operated by Sego Petroleum. And then we have a North Vacuum-Abo West Unit, which is operated by Texaco.

As you can see, our project area lies in the southern portion of the field.

Moving over to the Wolfcamp, which is the red dots, again showing cumulative production from the Wolfcamp, it's much smaller. Both it and the upper Penn kind of overlie the same area, and in this case the project area is a little bit more centrally located.

There are no active waterfloods in the Wolfcamp or upper Penn.

Q. Mr. Hickey, is Exhibit Number 7 a copy of Texaco's Application for authorization to inject, Form C-108?

A. Yes, it is.

Q. Does this contain all the information contained by that form?

A. Yes.

Q. Is this an expansion of an existing project?

A. No.

Q. Let's go to page 49 in this exhibit, and I'd ask you just to briefly identify what this is.

A. This is similar to -- Page 49 is similar to Exhibit Number 1, basically showing the plat of the wells

that have penetrated the Abo, Wolfcamp and upper Penn formations.

It shows the ownership, with Texaco being the leasee, the royalty ownership, the State of New Mexico on the -- it shows the location with the three injection wells, with the large red circles outlining the half-mile radius indicating the area of review.

And then flipping over to page 48 is another plat basically just showing all the wells drilled within a two-mile radius of the project area.

Q. What is the current status of the wells you propose to convert to injection?

A. They are active producers.

Q. Let's go again to Exhibit 7, and I'd direct your attention to pages 6 through 11 of this exhibit, and would you please explain to Mr. Catanach what these are and what they show?

A. Pages 6 through 11 are schematic drawings for each of the three proposed injection wells. They are the present and proposed completions. All three wells are currently completed in all three of the intervals and are downhole commingled.

Our plans are not to do any additional well work, but to go ahead and put the wells on injection through lined tubing with a packer, and the annulus will be filled

with fluid and pressure-tested as required by the underground injection control program.

Q. Does this exhibit contain all of the information on each of the wells within all of the areas of review required by Section 6 of Form C-108?

A. There are data on each well in tabular form on page 50. And there's data -- again, there are on the three injection wells; that's included on pages 6 through 11. And then all other wells, there are wellbore diagrams or data sheets for each of the wells in the area of review showing the type of well, construction, depth, record of completion and a completion date.

Q. And on those other wells, that's pages 17 through 41; is that right?

A. Yes, that is correct.

Q. Are there plugged and abandoned wells within any of the areas of review?

A. Yes, they are identified on page -- They've been identified in the table on page 50. Those are the McCallister State Number 7, the New Mexico "O" State NCT-1 Number 18 and the Well Number 24. Those sheets are included in the packet of wells from pages 17 through 41. Page 28, for example, is the wellbore diagram for the New Mexico "O" 18 showing the plugging data and the cement tops.

Q. What is the source of the water Texaco proposes to inject in each of the subject injection wells?

A. The produced water from the Glorieta and the Paddock formations and some of the San Andres water. These -- our tracts here underlie the -- currently injection units on the Vacuum Glorieta West Unit and the Central Vacuum Unit, so we'll be taken produced water from them.

Q. And what injection volumes does Texaco propose?

A. We're looking at an average daily rate of about 3000 barrels per day. That would be about 1000 barrels a day per well, with probably an initial maximum rate of about 2000 barrels a day for a total of 6000 barrels.

Q. Does Exhibit Number 7, the C-108, contain an analysis of the injection water?

A. Yes, on pages 43 through 47 there are several water analyses. Excuse me, starting on page 42, actually.

Q. Right.

A. 42 is the produced water analysis from the Abo, Wolfcamp and upper Penn formations.

Page 43 shows a scaling tendency on that particular water.

The next page, 44, shows the produced water analysis coming off of the Vacuum Glorieta West Unit, a scaling tendency analysis on that.

Looking at page 46, we did some combinations of

water between CVU, San Andres water and the Vacuum Glorieta West Unit water, and also between Wolfcamp water -- or the Wolfcamp and Abo and Penn waters and the Vacuum Glorieta West Unit water.

Q. Based on this work, can you testify that the waters that you will be injecting into each of these formations will, in fact, be compatible with the waters in those formations?

A. Yes, they will be.

Q. Will the system be open or closed?

A. Closed.

Q. Do you propose to inject by gravity or under pressure?

A. Under pressure.

Q. And what injection pressures is Texaco proposing?

A. Average injection pressure, about 1800 p.s.i.g., with maximum injection pressure of 2200 pounds per square inch.

Q. Now, these pressures exceed the .2-pound-per-foot depth limitation employed by the Oil Conservation Division; is that correct?

A. They would be within that range.

Q. If you go above that range, would you do so only after higher pressures are justified by step rate tests?

A. That is correct. We would just step-rate-test

before increasing pressure on them.

Q. In your opinion, will the proposed injection in these wells pose any threat to underground sources of drinking water?

A. No.

Q. Are there freshwater wells in the area?

A. Yes, there are. The freshwater zone, it would be the Ogallala at 200 feet.

Q. And are these wells located within a mile of any of the proposed injection wells?

A. There are four wells. There is a plat on page 12, I believe, showing four wells, and then subsequently on pages 13 through 16 there are water analyses from those wells.

Q. Based on your review, can you testify that the wells in the proposed project area are completed and cased in a fashion so as to prevent any problems with the contamination of the waters in these wells?

A. Yes.

Q. In your opinion, will what you're proposing pose a threat to any fresh water in the area?

A. No, it will not pose any freshwater threat.

Q. Have you examined the available geologic and engineering data on this reservoir?

A. Yes.

Q. And as a result of that examination, have you found any evidence of open faults or other hydrologic connections between an injection interval and any underground source of drinking water?

A. No.

Q. Mr. Hickey, in your opinion, will approval of this Application and the implementation of this proposed pressure maintenance project be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. And how soon does Texaco hope to commence this pressure maintenance project?

A. We hope to begin this year.

Q. Were Texaco Exhibits 6 and 7 prepared by you?

A. Yes.

MR. CARR: At this time, Mr. Catanach, we move the admission into evidence of Texaco Exhibits 6 and 7.

EXAMINER CATANACH: Exhibits 6 and 7 will be admitted as evidence.

MR. CARR: And that concludes my direct examination of Mr. Hickey.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hickey, how many producing wells are we going

to be utilizing here for this project?

A. After the three wells are converted there will be approximately four wells remaining. Plans are to expand that to as many as five or six wells.

Q. Expand it by additional drilling?

A. Additional drilling, plus I believe there's a well producing from a deeper horizon that could be plugged back into the Abo, Wolfcamp and Penn whenever it depletes in the formation it's in now.

Q. Can you identify the four wells that will be initially used for production? I'm looking at page 49 here, which is a pretty good map.

A. The producing wells --

Q. Yes.

A. -- would be the State "BA" Number 15, you have the New Mexico "O" State Number 11, and you have the New Mexico "O" State Number 39, you have the New Mexico "O" State Number 14, and that would be the four wells.

Q. Okay. The 18 well, that's a plugged and abandoned well?

A. Correct, 18 and 24 are plugged and abandoned. Number 17 is currently shut in and probably will be plugged and abandoned sometime in the near future.

Q. What about the 6 and the 8 on the "BA" lease?

A. Those are the injection wells.

Q. Oh, those are injection wells?

A. 6 and 8 are injection wells on the "BA" and the 38 is an injection well on the New Mexico "O" lease.

Q. Now, the four producing wells, how are they completed currently?

A. They are perforated and commingled to a certain degree in different zones.

The "BA" 15 is perforated with 5-1/2-inch casing in the upper Penn and the Wolfcamp. We have not yet -- That's the newest well we've drilled. We have not yet added the Abo to that.

The New Mexico "O" State Number 11 is currently commingled in all three zones. That is a -- we call a slimhole well. It was initially completed with three strings of 2-7/8 -- or smaller strings of tubing as casing. That was a common practice back when a lot of these wells were drilled back in the 1960s, but it has been commingled in all three zones.

The "O" 39 is also currently completed in the upper Penn and then the Wolfcamp. We have not yet added the Abo to it.

And I believe, if I remember right, the "O" 14 is completed in the Wolfcamp and upper Penn but has -- there was a deeper well, actually. You can kind of see it on this map here, there's a twin well right next to it, which

is the 87. That was completed in the upper Penn. It is no longer an upper Penn well, it has been plugged back and was completed in -- is currently part of the Vacuum Glorieta West Unit.

Again, we're looking at the subsequent drilling to further develop this based on the pressure maintenance.

Q. Well, is the potential for Abo production in the three southern wells, is that pretty low?

A. In --

Q. The wells on the "O" State Lease?

A. No, I think what the deal is, like in the "O" 39, we have a fairly good well, we just haven't gotten around to adding the upper pay. Once we start the pressure maintenance project, we'll go ahead and look at adding some additional pay in that well in the Abo.

Eventually the plan is to have all three wells, or all the producing wells and all the injection wells completed in all zones.

Q. Now, you guys aren't going to try and regulate in any way how much water goes into each of the zones?

A. No, we're not planning on running any type of diversion equipment to try to divert water.

What we probably will do is put the wells on injection, let them stabilize, run injection profiles, and if for some reason we see some type of conformance problem,

maybe go back and try to work the wells over to restimulate zones that may not be taking water.

But initially, given the low bottomhole pressure of the reservoir, we're just going to kind of let the water go where it may and just kind of monitor the results through injection profiles and offset production.

Q. Based on your current data, do you anticipate the water preferentially going into one zone?

A. No, to be honest with you I would kind of anticipate it would take water equally into the zones. I think the Abo formation is probably the most pressure-depleted but is probably the most -- tightest.

So I think -- The reservoir will dictate how we'll go, but I don't anticipate seeing one zone drink all the water, as opposed to the others. But until we actually start trying it, we probably won't know that answer for sure.

Q. Okay. The four producing wells, are those fairly marginal at this point in time? Do you know what the --

A. No, the overall -- I have some other data on the wells, but our overall from the project area, we're making, producing about 170 barrels of oil per day.

The "BA" 15 is about a 40-barrel-a- day well. That was the most recent one.

The "O" 39 makes about 60 barrels a day.

The "O" 14 is pretty marginal, it's only about 10.

I think the "O" 11 as well is only about 10 or 11.

The "O" 38, which is a converted well to be converted, is also fairly marginal. It's about a less-than-10-barrel-a-day well.

The "BA" 6 is about a 20-barrel-a-day well.

And the "BA" 8 is about a 40-barrel-a-day well.

Q. The only reason these were chosen was because of the pattern --

A. Yes.

Q. -- is that right?

A. Yes.

Q. Okay. Are you aware of any problems or -- I seem to recall that at one time Mobil up to the north had to use fresh water to inject into the Abo formation. Are you aware of any problems that they had or --

A. As far as injecting fresh water?

Q. -- or -- as far as not being able to inject a brine water into the Abo?

A. I don't know of any reason why they have had any problems. I do know that the Abo formation, particularly the upper Abo, is much tighter. I think we have relatively decent porosity and permeability in the upper Penn and in

the main producing interval of the Wolfcamp, which is the lower Wolfcamp, which is -- based on logs and porosity data, we think -- we don't anticipate any problems as far as injecting produced water.

EXAMINER CATANACH: Okay. I think that's all I have, Mr. Carr.

MR. CARR: Mr. Catanach, that concludes our presentation in this case.

EXAMINER CATANACH: Okay, that's all I have.

There being nothing further in this case, Case 12,638 will be taken under advisement.

(Thereupon, these proceedings were concluded at 12:08 p.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 12638, heard by me on April 5 2007.

David K. Catanach, Examiner
Oil Conservation Division

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 April 13th, 2001.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002