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:

APPLICATION OF ENRON OIL AND GAS COMPANY FOR DOWNHOLE COMMINGLING, EDDY COUNTY, NEW MEXICO

CASE NO. 11,782

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

May 15th, 1997

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, May 15th, 1997, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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A P P E A R A N C E S

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By: PAUL R. OWEN

* * *

WHEREUPON, the following proceedings were had at 11:18 a.m.:

EXAMINER CATANACH: At this time we'll call Case 11,748, which is the Application of Enron Oil and Gas Company for downhole commingling, Eddy County, New Mexico.

Call for appearances.

MR. OWEN: Paul Owen with the Santa Fe law firm of Campbell, Carr, Berge and Sheridan for the Applicant, Enron Oil and Gas Company.

I have two witnesses.

EXAMINER CATANACH: Additional appearances?

Okay, there being none, again, the record will reflect in this case that the two witnesses have previously been qualified and sworn in. Let me remind them they're still under oath.

And you may proceed, Mr. Owen.

MR. OWEN: At long last, we've reached the first Enron case on the docket.

My first witness is Mr. Pat Tower, which, Mr. Examiner, you are correct, he was previously qualified and accepted.

PATRICK J. TOWER,

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

DIRECT EXAMINATION

BY MR. OWEN:

Q. Mr. Tower, would you please briefly state what Enron seeks with this Application, which I believe does have to do with the Chester and the Morrow?

A. Yeah, actually coming back to the one I thought we were going to start with, what Enron seeks is authority to downhole commingle gas production from the Morrow formation in the Sand Tank-Morrow Gas Pool and the Chester formation in the Sand Tank-Chester Gas Pool in Enron's Sand Tank 7 Fed Com Number 1 well, which is located 990 feet from the north line and 990 feet from the west line of Section 7, Township 18 South, Range 30 East, in Eddy County, New Mexico.

Q. Is that a standard location, Mr. Tower?

A. No, it is unorthodox.

We -- Enron previously had received approval for this unorthodox location in April of 1996, under Administrative Order NSL-3644.

Q. All right, Mr. Tower, let's go to Enron Exhibit Number 1, which again is an orientation plat. Will you review that exhibit for the Examiner?

A. Yes. Again, a Midland map, in yellow depicting the spacing unit allocated to the Sand Tank 7 well. Surrounding this in red outlines are existing proration units, with the operators listed in red.

Q. Are the offset operators the same in each zone to be commingled?

A. Yes, they are.

Q. Have they all been notified of the Application?

A. Yes, they have.

Q. Is Enron Exhibit Number 2 an affidavit concerning the notice of this Application that has been sent by certified mail in accordance with the requirements of OCD rules?

A. Yes.

Q. Is this well located on federal land?

A. Yes, it is.

Q. Have you discussed this Application with the Bureau of Land Management?

A. Yes, we have, and they have indicated that, again, similar to a previous case we had today, that they had no problem with it, once the State -- subject to the like approval of the State.

And we will be filing sundry notices on this thing. We have not filed it at this point.

Q. How many offset operators are there, to be

affected?

A. In effect, two: Enron and Yates Petroleum.

Q. Is Exhibit Number 3 a waiver letter from Yates?

A. Yes, Exhibit Number 3 is a waiver letter from Yates. They are also partners in this particular well with us and also the offset operator. The waiver letter indicates that they have no objection as an offset operator to this operation.

Q. Mr. Tower, were Enron Exhibits 1 through 3 prepared by you or compiled under your direction or supervision?

A. Yes, they were.

MR. OWEN: Mr. Examiner, I move the admission of Enron's Exhibits Number 1 through 3.

EXAMINER CATANACH: Exhibits 1 through 3 will be admitted as evidence.

MR. OWEN: I have no further questions of this witness.

EXAMINER CATANACH: I have no questions of this witness.

He may be excused.

MR. OWEN: Mr. Examiner, my second witness is again Mr. Randy Cate, who has also been previously recognized and his qualifications have been accepted in today's hearings.

RANDALL S. CATE,

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

DIRECT EXAMINATION

BY MR. OWEN:

Q. Mr. Cate, are you familiar with the Application filed on behalf of Enron in this case?

A. Yes, I am.

Q. Are you familiar with the Sand Tank 7 Federal Com Well Number 1?

A. Yes, I am.

Q. What's the current status of this well?

A. The current status is, it's a dual completion of the Morrow and the Chester, both in the Sand Tank Pools, not yet commingled. We're asking for downhole commingling authority because the Morrow is exhibiting loading characteristics, and the -- which is going to cause it to become a marginal zone.

And the Chester is -- This one is the only producing Chester zone in the area currently, although there's some behind pipe in other wells. And we were going to ask that this be a reference case to facilitate administrative approvals in the future.

Q. Is commingling necessary to permit a zone or zones to be produced that would not otherwise be

economically producible?

A. Yes, the Chester being the deeper zone, typically, in this area -- Again, this is the only well that we have found that is producing commercial quantities. But due to it being in the deeper zone, in order to not delay production of the Morrow, which is the primary zone in the area and the highest reserves, the only option is to dual complete or downhole commingling.

Once the dual completion is what we attempted, and now we're finding that the Morrow flowing up the annulus is exhibiting loading characteristics, which is reducing the flow rates of that zone.

Q. Now, Mr. Cate, why has this matter come to hearing, as opposed to simply being administratively approved?

A. Well, again, we want this to be set as a reference case for the area. There are two other wells.

Also, the rates, we believed the Division again would prefer to go with -- to hearing on this initial case because of the rates and the fact that this is the first in the area for a Morrow and a Chester.

Q. And you do seek to make this case a reference case?

A. Yes, we do.

Q. All right, Mr. Cate, let's go to Enron Exhibit

Number 4, which again is an OCD Form Number C-107-A.

A. Yes.

Q. Will you review the information contained in the form, and then we'll go through the attachments --

A. Yes --

Q. -- for the Examiner?

A. -- I'll do that.

Again, just going down it quickly, the Chester is the deeper pay that we had found. Both are gas, both are flowing. The pressures, current and original, that we have show that the current pressure of the higher-pressured zone is not above the original pressure of the lower-pressured zone. So there would be no problems there from a gradient point of view.

The oil gravities and gas contents -- or excuse me, the condensate gravities and the gas contents and compositions are almost identical. Both are producing. They could both be considered marginal very soon, based on the high declines. And based on just recent tests, approximately 450 MCF a day out of the Morrow zone and 750 MCF a day out of the Chester zone.

Again, the allocation will -- Since we have not commingled these zones yet, we'll need to see some production, and then we can arrive at the proper allocation formula. We do have a substantial history on both zones,

so we should be able to give an accurate allocation.

Again, I do not believe that crossflow will occur, based on the bottomhole pressures. They're both very close, within 450 pounds on both zones of each other, and obviously in a producing state I doubt any crossflow will occur at all.

We've had the waters analyzed and there is no incompatibilities. There's an attachment proving that. And again, the value will not be decreased by commingling, based on the similar nature of the production and the fact it's going to the identical market.

And then I can go through the attachments.

Q. What is Attachment Number 1?

A. Okay, I did expand, again, on the 7(b), which is the marginal nature. Again, once we look at the decline curves, you'll see that very shortly this Morrow, which is the primary producing zone in the area, is exhibiting loading characteristics. The nodal analysis predicts that.

As a result of being able to commingle downhole and bring both zones up the tubing, I anticipate the Morrow production to increase to 300 to 500 MCF a day. And of course, that will result in not only an accelerated recovery but additional recoveries on a commingled string.

Also, again, under Section 9, we'll get -- review the recommended allocation formula with the District

Supervisor, once we do get a response on the production.

This well -- I do anticipate eventually we may want to request a gas lift similar to the previous case. Now, we don't make water here, but there are liquids, condensates, that are producing.

I don't anticipate that for quite some time. But again, we would review that with the District, or the Division if you prefer, before we install that. I don't anticipate it would really have any change on the allocations of the zones. But again, it will aid in recovering the most -- or the maximum amount of reserves from these wells.

And then at the bottom there, I do request that this be considered a reference case. There's a Yates well that Enron has an interest in, and Enron has two wells that we drilled down to the Chester attempted completions. They're in the 200-MCF-a-day range, and right now we came up into the Morrow. I would anticipate that we would like, at some point in the future, to commingle those when the Morrow production falls a little more and then having this reference case will aid that administratively.

Q. What is the second attachment to --

A. Yes, again, the attachment of the C-102, showing that this is a standup west-half 320 proration unit for both zones.

The decline curves are the next attachments. The Chester is the first one here. It has been flowing up the tubing. It is a carbonate that's been flowing up the tubing and it's fairly stable, although the decline just in the last two to three months has turned. Nodal analysis tells you that under -- I think 1200 to 1500 MCF a day, even up the tubing, that you are in a loading regime. And so the steeper decline that we're seeing in the last couple of months, there's a good chance that that is due to some loading characteristics.

The next curve is the production decline on the Morrow, which is producing up the annulus, that annulus area is three to four times the annulus of the 2 7/8 tubing, and therefore has a lot -- requires a lot higher rates to produce the velocity tc efficiently lift its liquids.

Again, in the last, really, six months, this well has been on a much steeper decline than we anticipate for production in this area. And again, I believe that's due to loading, liquid loading, within the casing annulus.

The next attachment is the wellbore diagram. Again, it shows that we have a sliding sleeve in place. Our plan would be to simply open the sliding sleeve and shut in the casing and bring all the gas and associated produced condensates up the tubing, supplying enough

velocity to aid both streams in their production characteristics.

And finally, the compatibility comparison for the waters that are produced, showing that there are no incompatibilities that were found.

Q. Now, if the well is shut in for an extended period of time, can you prevent crossflow between the zones?

A. Yes, again, we can prevent crossflow by closing the sliding sleeve. I don't anticipate during normal operations that that will be necessary.

Q. What kind of fluids are being produced from each zone?

A. Condensates and gas of course, and then very little water. The -- On the very last attachment, the Morrow water in this case appears very fresh. It is probably just condensing out of the gas stream.

The Chester, being in carbonate, and it is -- does show that that is probably a formation water that is producing, although it's very slight. It's only, I think, two to three barrels per day. And again, we don't see any incompatibilities on the fluid.

Q. Based on evidence in the area, do you think that either zone is a fluid-sensitive zone that might be damaged by water or other producing fluids?

A. No, I don't. There's no evidence of that. We have acidized both zones, you know, with KCl-type waters. We haven't seen any evidence that damage would occur.

Q. And again, will you present the OCD District Supervisor recommended allocation and production once you receive a stable flow, and will you periodically review that and adjust that allocation formula as necessary?

A. Yes, I believe based on the decline curves that we're seeing here, and if the anticipated response of the commingled production stream is -- I believe, will increase the 300 to 500 MCF a day, possibly, and I believe that we can have a fixed allocation for substantial periods of time in the six-month, possibly a year, and then we would continue to review that with the District Supervisor as production characteristics change.

Q. Have the same zones been approved for downhole commingling in other wells in this area?

A. Not in this area that I know of.

Q. Will commingling result in a zone or zones being produced which would not otherwise not be economically producible?

A. Yes, it will allow us to recover more ultimate reserves out of both zones.

Q. And will approval of this Application be in the best interest of conservation, the protection of

correlative rights and the prevention of waste?

A. Yes.

Q. Was Enron's Exhibit Number 4 prepared by you or compiled under your direction or supervision?

A. Yes, it was.

MR. OWEN: Mr. Examiner, I move for admission Enron Exhibit Number 4 and its attachments.

EXAMINER CATANACH: Exhibit Number 4 will be admitted as evidence.

MR. OWEN: I have no further questions for this witness at this time.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Cate, you've got some other wells in this area that might be candidates for this type of commingling?

A. Yes. Again, we've got two that I can think of right now that we have tested the Chester and left it below a bridge plug. Yates actually left theirs below a packer, so I know they're intending to -- and we have an interest in those wells. I think it's called the Cerros Locos.

But again, the rates there were only in the 200- to 300-MCF-a-day range. And of course, the Morrow being the primary target in the area and the biggest producer, we're either going to have to just leave the Chester till the end or, it being a marginal zone, it behooves us to get

the authority to commingle.

Q. Do you have any other wells that you plan to drill to these two formations?

A. We currently are taking every well that we drill -- For the Morrow, we go ahead and take it down to this Chester carbonates. It aids us in mapping, for one thing.

But primarily, based on -- As you can see, it looks like there's a potential for half a BCF out of this Chester zone, and those are good reserves. They're not going to -- You can't drill for those by itself, but it does make it worth taking your wells to the Chester.

Q. With as little fluid as the Morrow is producing, you still attribute the steeper decline to liquid loading?

A. Yes, I do. And I've got a loading table -- I'm not sure if it's in this file or the other one -- that I can provide you. Again, the annular space calculations are approximately four times that of coming up the tubing, and the velocities, again, are going to be four times.

I believe it's almost 2 million a day of gas required to provide the velocity that will not -- I mean, that will prevent loading within that large of the annulus space. So I'm certain that that's what the problem is.

EXAMINER CATANACH: I don't have anything else, Mr. Owen.

MR. OWEN: I have nothing further for this witness, and my presentation for this case is concluded.

EXAMINER CATANACH: Okay, there being nothing further in this case, Case 11,782 will be taken under advisement.

(Thereupon, these proceedings were concluded at 11:38 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11782, heard by me on May 0, 1997.

David R. 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 May 20th, 1997.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998