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. 11,748
APPLICATION OF ENRON OIL AND GAS COMPANY FOR DOWNHOLE COMMINGLING, EDDY COUNTY, NEW MEXICO	)	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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I N D E X

May 15th, 1997
Examiner Hearing
CASE NO. 11,748

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E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	5	7
Exhibit 2	6	7
Exhibit 3	6	7
Exhibit 4	9	17

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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 10:56 a.m.:

EXAMINER CATANACH: At this time we'll call Case 11,748.

MR. CARROLL: Application of Enron Oil and Gas Company for downhole commingling, Eddy County, New Mexico.

EXAMINER CATANACH: 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: Any additional appearances?

Okay. I believe, Mr. Owen, your witnesses have previously been sworn in a previous case and have been qualified previously, so we can dispense with that.

MR. OWEN: In that case, Mr. Examiner, my first witness is Mr. Pat Tower.

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 tell us what Enron seeks with this Application?

A. Yes, Enron seeks authority to downhole commingle

gas production from the Morrow formation out of the Sand Tank-Morrow Gas Pool and the Chester formation out of the Sand Tank-Chester Gas Pool in its Sand Tank 7 Federal Com Number 1 well, which is located 990 feet from the north and west line --

EXAMINER CATANACH: I think we're on the wrong case.

Q. (By Mr. Owen) Mr. Tower, is this Atoka and Morrow, actually?

A. Oh, are you on 6?

EXAMINER CATANACH: We're actually doing 11,748.

THE WITNESS: Excuse me, excuse me. We took them out of order again. My fault. We'll come back to that.

Okay, let me back up.

Enron seeks an identical order -- authority to downhole commingle gas production from the Atoka formation in the Sand Tank-Atoka Pool and the Morrow formation in the Sand Tank-Morrow Gas Pool in its Sand Tank 6 Federal Well Number 1, which is located 1980 from the north line and 1650 feet from the east line of Section 6, Township 18 South, 30 East Eddy County.

Q. (By Mr. Owen) Enron's Exhibit Number 1 in this case is a land -- is an orientation plat. Would you review that for the Examiner, please?

A. Yes, I will.

Again, a land plat in yellow depicts the spacing unit allocated to the Sand Tank 6 well. In red are the outlines of all of the offsetting spacing units and the current operators of those particular units.

Q. This is the same Sand Tank 6 well discussed in the previous case; is that correct?

A. Yes, it is.

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

A. Yes.

Q. Have all the offset operators been notified of this Application for commingling?

A. Yes, they have.

Q. Is Enron Exhibit Number 2 an affidavit confirming that notice of this Application has been provided in accordance with OCD rules?

A. Yes, it is.

Q. Is this well located on federal land?

A. Yes, it is.

Q. Have you notified the Bureau of Land Management of this proposed location?

A. Yes, we have.

Q. Is Exhibit Number 3 a conditional approval of the BLM of this proposed location?

A. Yes, it is. It's a sundry notice approving the

commingling, subject to like approval by the State.

Q. Will Enron call an engineering witness to review the technical portions of this Application?

A. Yes, we will.

Q. Were Enron Exhibits Number 1 through 3 compiled by you or prepared 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 at this time.

EXAMINER CATANACH: I have no questions of this witness. He can be excused.

MR. OWEN: Mr. Examiner, my second witness is Mr. Randy Cate, who was previously qualified and recognized in a previous case today.

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 6 Federal Well Number 1?

A. Yes, I am.

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

A. The current status is that this well is flowing -- both zones are flowing from the Sand Tank-Atoka Pool and the Sand Tank-Morrow Pool, and since April we have gone ahead and commingled the streams, mainly to test the ideas of the aid that we would receive from the commingling because of the fact that the lower Morrow in the Sand Tank 6 well is producing at a high water cut and was very close to dying on us, and we need to initially gas lift, which is part of what this authority is being asked for.

Q. In that case, is commingling necessary to permit a zone or zones to be produced which would otherwise not be economically producible?

A. Yes. Yes, the granting of this authority will help us recover the maximum amount of gas from the lower Morrow, and we'll show that the Atoka zone is almost depleted, very limited reservoir. And I have a wellbore schematic that I'll discuss and show what our intent is on a mechanical basis, what we would ask for on a setup.

Q. Why is this matter a separate hearing as opposed to being simply submitted for administrative approval?

A. We believe due to the producing rates of the commingled stream, that the Division would prefer a hearing on the process and that -- Well, that's the primary reason. And this is not -- There is not a reference case that we could point to in this area where Atoka and Morrow had been previously approved.

Q. Okay, Mr. Cate, I notice that you only have one exhibit in this case, which is Form Number C-107-A, an OCD application for downhole commingling. Why don't we review that form and its attachments for the Examiner?

A. Okay, this exhibit is the C-107-A form that was a result of recent amendments to the downhole commingling rules, and this form is filled out with the attachments being these items necessary or requested by this form. And I would like to just go through the form and the attachments, if I might.

Q. Why don't we go through the information contained on the form itself?

A. Okay. Again, if you go to letter designation 1 in the table, we are asking for the approval to downhole commingle production from the Sand Tank-Atoka Pool and the Sand Tank-Morrow Pool. There was not a pool number available for the Sand Tank-Atoka at the time. We're still trying to find that.

Also list the top and bottom perforations.

They're both gas, so we're asking for commingling of both gas -- two gas zones. They both are flowing. We have bottomhole pressures, the current and the original of zones. The significance here is that the current anticipated pressure of the higher pressured zone will not be more than the original pressure of the lesser pressured zone.

The Section 6 there describes that both gases are very similar in BTU content. They are both producing.

As far as marginal production, I discuss that a little bit on the next page, go into more detail there. Again, we -- Currently, this is a commingled stream, and based on the flow rates, I'm showing 700 MCF a day and 5 barrels of condensate to be coming from the Atoka, while 1800 MCF per day and 14 barrels of condensate and 171 barrels of water is being produced from the lower Morrow zone.

Section 9 I'll discuss on the next page for the allocation formula. I think Mr. Tower has discussed Section 10 there.

11 is a crossflow. I do not believe, given the current bottomhole pressures, that crossflow will occur. Now, the Atoka is the lower-pressured interval, and -- but we know that the flowing bottomhole pressure of the Morrow is lower than the shut-in pressure of the Atoka, currently

by about 300 pounds. Our intent, again, is to convert the back side to gas injection and begin just supplementing the gas to ensure that the lower Morrow now will continue to flow.

The Section 12 there, the produced fluids are compatible. We have an attachment that confirms that. The value of the production will not be decreased by the commingling. The condensates and the BTU gravities and composition -- I mean the condensate gravities, the BTUs and the fluids compositions are identical and go to the same market.

Let's see, and I think Pat did discuss the BLM notification, and then we can get to the attachments.

Q. All right, let's look at attachment number 1 to Exhibit Number 4.

A. Okay. Again, this is -- I just wanted to explain a little more on what we're trying to accomplish here. The Sand Tank-Atoka is nearly depleted, and I'll show you the decline curve in just a second. And it shows that there's basically only 30 million cubic feet of gas remaining in this almost depleted zone. Again, it's only 1300 pounds bottomhole.

The Morrow production has been declining at a very high rate due to the water cut. Again, 171 barrels a day. We do know that that is Morrow water, we've analyzed

that. And the well is going to require gas lift in order to maximize our recovery of reserves.

The P/Z information for the lower Morrow suggests that we can recover another half a BCF to possibly a BCF of gas, but it will require artificial lift.

The -- And we do plan injection as soon as two to three months.

The Section 9, the allocation formula is going to vary, and we would like to get with the District Supervisor and review that and get approval. Or if the Division desires, we can just submit it directly to you.

For April, which is the first month of production, based on the current rates, I would anticipate a 28 percent to the Atoka and 72 percent of the gas to the Morrow.

Now, in May, that -- And it's going to be a declining average, so it kind of depends; I have to kind of look at it each month to see what's remaining. And when we start our gas injection down the annulus, then the Atoka will stop getting any allocation.

Then, once the process is done, we will close the sliding sleeve in the well, thereby isolating the zones again. If there's any remaining Atoka gas, we'll blow it down. And I'd anticipate, you know, minimal amounts there.

So that's basically our plan.

The next page is the C-102 which is requested as an attachment. It does show that this well is dedicated on an east-half proration unit.

The next attachments are the decline curves for each zone. As you can see in April -- And again, these are dailies. We have a system where we basically keep track every day of what the production is doing. It comes in from the field.

And you can see in April we did commingle the zones and we did receive benefit from -- as a gas would benefit to the lower Morrow. And the rates definitely on that well was down to approximately 1000 MCF a day, and now we believe it's -- due to the help of the Atoka it's up to 1800 MCF a day.

The Atoka zone is the next decline curve, as you can see. Basically from day one it has been on 100-percent decline. It's a depletion drive limited reservoir. No water production was seen. And you can see the projection is basically for maybe 30 million cubic feet of gas remaining. And we'll take that into account when we do our allocation.

Q. With the production decline curves, can you -- do you have enough data to permit a reasonable allocation between the production --

A. Yes, I believe --

Q. -- from each zone?

A. Yes, I believe we do, that the -- You know, we'll probably, in the next few months, basically achieve the allocated on the Atoka of the remaining reserves as shown here, and -- because we basically anticipate starting our gas injection within the next few months also.

And basically we would be injecting at a bottomhole pressure of 600 to 800 pounds, which is about what the abandonment pressure of these zones is going to be anyway. And again, like I stated before, once the operation is finished, there may be a slight amount of blowdown gas that will turn to a low pressure system, and just see what we might get. But I think, based on the amount of data we've got, we can accurately allocate.

Q. Now, the next attachment to Enron Exhibit Number 4 is a well schematic?

A. Yes, and that shows the perforated intervals. Again, we have a sliding sleeve. We initially dual completed this well, and we were hopeful -- when you initially make completions, we didn't know that the Morrow was going to require a gas lift so quickly, and of course we had no idea the Atoka would be such a limited reservoir.

So the best utilization of this wellbore is to simply open that sliding sleeve and turn it into a gas lift, rather than be forced to try to pull the tubulars and

squeeze zones and potentially jeopardize the remaining reserves through a workover-type operation.

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

A. Yes, we simply come back in and close the sliding sleeve. And so if there's any appreciable time, from either several days to a week, that we cannot anticipate restoring production, then we will close the sliding sleeve.

Q. What kind of fluids are going to be produced from each zone?

A. Condensate and then water from the lower Morrow, in fairly high rates. Probably up to 200 barrels of water per day.

Q. Will these flows be compatible in the wellbore?

A. Yes, the last attachment shows Martin Water Labs has analyzed the waters, which we noted the Atoka water is basically fresh. It is probably just a condensent that's come out of the stream, but we don't really produce a formation water in the Atoka.

And of course the Morrow is Morrow water at what we anticipate up to 200 barrels per day.

Q. Will either zone be damaged by the commingling or by the presence of water in the other?

A. No, there's no evidence that that would occur.

Again, the Morrow is producing substantial amounts of water already. The Atoka is a similar type of sand, and we just don't have any evidence based on this compatibility study that there would be any damage.

Q. And if the streams are commingled, will the price received for the production from either be affected?

A. No, it's the same market, same stream, same basic composition. Substantially, what I think will just primarily be happening is, we'll be producing increased amounts of Morrow due to the gas lift.

Q. Will you present recommended allocation to the OCD's District Supervisor when you are able to determine that, and will you adjust that allocation figure as the Atoka production declines?

A. Yes.

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

A. Not that I know of in the area, no.

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

A. It does. It aids us in achieving a much higher recovery on the lower Morrow zone.

Q. Will approval of the Application otherwise be in the best interest of conservation, the protection of

correlative rights --

A. Yes.

Q. -- and the prevention of waste?

A. Yes, it does.

Q. Was Enron Exhibit Number 4 and its attachments prepared by you or compiled under your direction or supervision?

A. Yes, they were.

MR. OWEN: Mr. Examiner, I move the admission into evidence of Enron's Exhibit Number 4.

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

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

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Cate, the Atoka doesn't produce any water, does it?

A. No, it does not.

Q. Will that be exposed to some Morrow formation water?

A. It could be exposed to some. Again, I don't believe that there will be crossflow under our normal gas conditions. We anticipate 600- to 800-pound bottomhole flowing pressure, and the pressure of the Atoka right now

is approximately 1300 pounds.

So as long as we keep it in a producing status then I would not anticipate that it would be exposed to water. Again, if we do get into a situation of shut-in, then we can get right in there and close that sliding sleeve, thereby isolating the zones again.

Q. How would you implement gas lift in this well?

A. We will simply set a compressor to inject gas down the annulus, which is open to the Atoka, and then through the sliding sleeve, which will be open, and that volume will then -- all the production will be coming up the tubing.

There's high-pressure lines out there, but we'll probably just take a compressor that will be capable of injecting enough gas.

Q. How much -- How do you determine how much to inject?

A. It's a velocity calculation that one can do. But generally, you need 3000 to 4000 cubic feet per barrel of fluid that you're lifting. 200 barrels of, you know, water per day will -- possibly up to 4 million a day of gas in the worst case, down -- or no, excuse me, 800 MCF a day to assist.

If you look at your decline curve on the lower Morrow, you can see it has been declining prior to the

commingling at approximately a 92-percent decline.

The other lower Morrows in this area tend to take on -- When they don't have water, they tend to take on a hyperbolic decline, and the rates will tend to stay higher for a longer period of time, so we really do believe that the dramatic decrease in this well's production is due to the water and to a loading.

If you do a nodal analysis on this well, its rates are below what is required to efficiently lift the fluids from the tubing site.

Q. During gas injection, you testified that you're not going to have any Atoka production; is that your --

A. I would anticipate not, that basically the bottomhole pressure is going to be very similar to the shut-in pressure of the Atoka, and I would anticipate that we will probably -- Unless there's any evidence, I would anticipate that during gas injection we will show zero attributable to the Atoka.

Q. Okay. And you'll work with the District Supervisor on the allocation, and that may change month to month?

A. I anticipate it will, yes.

Q. As a result of commingling, how much do you think additional recovery you might get from this well?

A. At least half a BCF from the lower Morrow and

possibly up to another BCF of gas.

EXAMINER CATANACH: Okay, I have nothing further of this witness, Mr. Owen.

MR. OWEN: I have nothing further either, Mr. Examiner.

EXAMINER CATANACH: Okay, there being nothing further in this case, Case 11,748 will be taken under advisement.

(Thereupon, these proceedings were concluded at 11:15 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11748, heard by me on July 15 1999.

David K. Catanach, Examiner
Oil Conservation Division

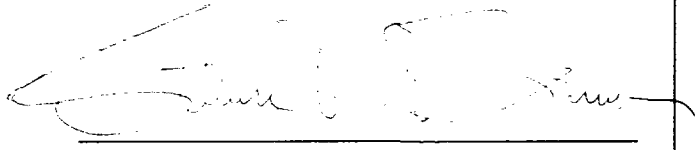
CERTIFICATE OF REPORTER

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 May 20th, 1997.



STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998