NEW MEXICO OIL CONSERVATION DIVISION

Examiner Hearing
Santa Fe, New Mexico
September 16, 1999 -- 8:15 A.M.

Name	Representing	Location
Tommy Folsom	Marbob Energy	Carlsbad, NM
KEITH LOGAN	Marbob Energy	MIDLAND TX
SCOTT HALL	Marbob NM	SF
PAUL HADEN	Marbob Energy	MIDLAND TX
PAUL OWEN	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
BARNEY KAHN	ENERGEN RESOURCES	PLANO
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	SF
[illegible]	[illegible]	ABQ
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

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. 11,773
IN THE MATTER OF CASE NO. 11,773 BEING REOPENED PURSUANT TO THE PROVISIONS OF DIVISION ORDER NO. R-10,854, WHICH ORDER PROMULGATED TEMPORARY SPECIAL RULES AND REGULATIONS FOR THE WEST MALJAMAR-DEVONIAN POOL IN LEA COUNTY, NEW MEXICO, INCLUDING A PROVISION FOR 160-ACRE SPACING	

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OIL CONSERVATION DIV.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

September 16th, 1999

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, September 16th, 1999, 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

September 16th, 1999
Examiner Hearing
CASE NO. 11,773

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	6	17
Exhibit 2	7	17
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Exhibit 8	15	17

* * *

A P P E A R A N C E S

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By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 8:20 a.m.:

EXAMINER CATANACH: Call the hearing to order this morning for Docket Number 28-99. I will call the dismissals and continuances first.

(Off the record)

EXAMINER CATANACH: At this time we'll call Case Number 11,773.

MR. CARROLL: In the matter of Case Number 11,773 being reopened pursuant to the provisions of Division Order Number R-10,854, which order promulgated temporary special rules and regulations for the West Maljamar-Devonian Pool in Lea County, New Mexico.

EXAMINER CATANACH: Call for appearances in this case.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of Conoco, Inc. We have one witness.

EXAMINER CATANACH: Call for additional appearances?

Okay, will the witness please stand to be sworn in?

(Thereupon, the witness was sworn.)

MR. KELLAHIN: Mr. Examiner, on a hearing on March 1st, 1997, Conoco presented a request for special pool rules for the West Maljamar-Devonian Pool.

As a result of that presentation, the Commission adopted special rules for the pool. This is an oil pool, and it provides now for 160-acre oil spacing for one well per 160 acres. It has some footage exceptions, and it has a special oil rate, a daily oil rate, of 900 barrels a day.

Our engineering witness back in May of 1997 was Mr. Paul Schulz. Mr. Schulz is back today to provide you the engineering data in support of his recommendation today that you continue the special rules for a temporary period of two years.

He will demonstrate to you that the discovery well has demonstrated the capabilities of draining 160 acres.

There has been some mechanical problems with that well. It currently is not capable of producing the 900 barrels a day, but they would like to have that opportunity to continue the rules so that when remedial action is taken on this discovery well it will afford the opportunity to produce at the levels currently approved.

With that opening statement, then, we would like to present Mr. Paul Schulz.

PAUL SCHULZ,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Schulz, for the record, sir, would you please state your name and occupation?

A. My name is Paul Schulz, S-c-h-u-l-z. I'm employed by Conoco, Inc., as a staff reservoir engineer in its Midland, Texas, office.

Q. You testified at the original hearing of this special pool rule case back in 1997?

A. Yes, I did.

Q. And you've continued to be responsible for the engineering data and conclusions concerning this well and this pool?

A. Yes.

Q. Let's turn to Exhibit 1. Would you take a moment and simply identify what we're looking at on Exhibit 1?

A. Okay, Exhibit 1 is a land plat of the area around the West Maljamar field. Shown on the plat are the two Devonian penetrations that Conoco has, the Elvis Number 1 well located in the northwest quarter of Section 20 and the Elvis Number 2 well, which is located in the southeast quarter of Section 17.

Q. Which is the discovery well?

A. The Elvis Number 1 is the discovery well.

Q. At the time of the original hearing in this case, what was the status of the Number 2 well?

A. The Number 2 well was drilling at that time.

Q. And what's occurred since then?

A. The Number 2 well was placed on production. We produced all the oil we could out of the well. The well is now currently on temporary shut-in status. We're using it as a pressure-observation well to monitor the Devonian reservoir pressure.

Q. Let's turn to Exhibit Number 2. Is this a summary of the well data for the Elvis Number 2 well?

A. Yes, it is.

Q. What conclusions can you reach concerning the pool rules we now have in place, based upon the data you received from the Elvis Number 2 well?

A. That the Elvis Number 1 well is probably effectively draining at least 160 acres. At that point, that's about all I can say regarding the Elvis Number 1 well from the Elvis Number 2.

Just looking at it, the Elvis Number 2 well is located about 2700 feet northeast of the Elvis Number 1 well. When it penetrated the Devonian, it penetrated the Devonian reservoir about 62 feet lower. Based on the

production results and some log-interpretation work, we've concluded that that location represents probably the oil-water contact for the pool.

Q. What type of drive mechanism do we have in this reservoir, Mr. Schulz?

A. It's a water drive.

Q. Did you see any pressure depletion between the Number 1 and Number 2 well?

A. Yes, we did, in the sense that when we put the Number 2 well on production, the pressure we noted was equal to the pressure we were seeing in the Number 1 well.

Q. Let me have you turn to Exhibit 3. Identify what we're seeing here.

A. Okay, Exhibit Number 3 is a production plot of the Elvis Number 2 well history. It just shows basically the well coming on in mid-summer of 1997, experiencing a very severe decline and being shut in in March of 1998.

Q. All right, let's turn to the discovery well data. If you'll turn to Exhibit 4, what is summarized here?

A. This is a summary of sort of the basic data about the Elvis Number 1 well. It indicates the current perforated interval for the well is 13,771 to 13,781. The well is being produced by a submersible pump at this time, with the pump set at a depth of 7994 feet, and the Devonian reservoir pressure as of the first of this month,

September, 1999, is about 4200 pounds.

It also has a table which contains a monthly production summary from initial completion, December, 1996, to July, 1999, which is the most recent date we keep in our database.

And finally, a little table at the bottom giving the cumulative production history of the well to date, showing that the well has produced about 498,000 barrels of oil, 1.2 million barrels of water and about 915,000 MCF of gas.

Q. In the absence of the special oil allowable, a well on 160 oil spacing, using the standard depth bracket allowable would provide a daily oil rate of what, sir?

A. I believe 695 barrels of oil a day.

Q. Has this well demonstrated the capacity in the past to produce in excess of the 695?

A. Yes, it has. If you'll look, for example, at the date 5-97, it had a monthly production average of 736. In September and October of 1997 it also averaged about 750 barrels a day in that period.

On daily production rates, which are not reflected in this monthly production total, we have seen individual rates as high as 990 barrels a day.

Q. Did the well demonstrate that capacity without having an adverse consequence on the reservoir or on its

producing capabilities?

A. Yes.

Q. Let's turn to Exhibit Number 5.

A. Okay, Exhibit Number 5 is a production plot of the Elvis Number 1 well history. There are a couple of points that need to be brought to the Commission's attention.

The first is, if you'll look at the date around July, 1997, you see a rather steep production drop at that point. That was Conoco's first attempt to enhance the productivity of the well.

The original testimony we gave back in May of 1997 indicated this well had a very high skin factor due to the limited completion. At that time we only had three feet of perforations open.

This was our attempt to add additional perforations. We went into the well in an underbalanced state, added an additional seven feet of perforations and the well died, which was not very pleasing to Conoco management.

So we went in and did a minor acid stimulation, managed to restore well productivity. And at that point, although it is not shown on the monthly rates, the daily well rates for that period, for about a two-week period of time, did exceed 900 barrels a day.

The well was produced with these ten feet of perfs at that rate till about January of 1998. In January of 1998 we were preparing to complete the additional 25 to 30 feet of interval. However, prior to that completion, the decision was made to attempt another small acid job on the well in order to possibly clean out any paraffin buildup.

So Conoco went into the well with the same procedure that we used to restore production six months prior. And at that point the cement behind the casing broke down. We opened up a water channel to the underlying aquifer, and the well watered out at that point. So the well was no longer capable of flowing under natural conditions, so we put the well back on a submersible pump and we returned production to about 700 barrels a day, and that's the condition the well is at at this time.

Q. Were you able to obtain sufficient reservoir and engineering data from which to determine the effective drainage area for the discovery well?

A. Yes, we were.

Q. As part of that effort, were you able to accurately estimate the ultimate recovery from this well?

A. Yes, we were. That's -- A couple of techniques of estimating the ultimate recovery, the EUR for this well, are shown on Exhibit 6.

The first one would be a standard decline analysis using exponential decline. You see a straight -- If you look at the item number I which says "Decline Curve Analysis", you see that a straight line is indicated by that trend. On that basis, taking the well down to an economic limit of about 20 barrels a day, which is the level we feel we can run the sub pump at, you'd have an estimated ultimate recovery for the well of about 605,000 barrels.

Below it is an alternate ultimate recovery estimation technique that they call "Water Cut Extrapolation". What you do on this technique is simply plot the cumulative oil production versus either the cartesian instantaneous oil cut or the log instantaneous oil cut. It really doesn't matter, as long as a straight-line trend is observed.

And if you'll notice that once again, a straight-line trend is observed from our current location, taking the well down to a water cut of about five percent. And that methodology indicates that we should expect estimated ultimate recovery of about 600,000 barrels.

So if you summarize it either by exponential decline or water-cut extrapolation, we're looking at the EUR for this well to be about 600,000.

Q. Were you able to calculate what, in your opinion,

is the effective drainage area for the well?

A. Yes, we did, and that would be on Exhibit 7.

Q. All right, let's turn to that and have you summarize your analysis.

A. Yes, Exhibit 7 shows how you might calculate the drainage are for this well. The first part would be trying to determine the original oil in place for various-size spacing units, using a basic volumetric equation.

The input values, there are a few differences between the reservoir thickness and porosity as were presented to the OCD back in May of 1997, what our current thinking is.

As you see, originally we estimated that the reservoir thickness was about 50 feet and the average porosity was about 12 percent. Currently our thoughts are that the reservoir thickness is about 45 feet and the average porosity is only 8 percent.

Plugging in the standard volumetric equation with the other variables, you get original-oil-in-place estimates anywhere from, say, 328,000 barrels under the current values for a 40-acre spacing unit, up to about 1.3 million barrels, using our current assumptions, for a 160-acre spacing unit.

Q. In order to complete your analysis, did you make any assessments or judgments about the recovery rates --

A. Yes.

Q. -- that you could expect?

A. Yes, we did. You can do a recovery efficiency simply by dividing the estimated ultimate recovery of the well by the original oil in place. A literature search revealed that for carbonate drive reservoirs, your theoretical recovery efficiency might be in the 44-percent range. That would be recovering 44 percent of the original oil in place.

Using the Czaze and Buckley correlation, which is a method of trying to predict residual oil saturations in water-drive systems, you get about 43 percent of original oil in place. So that would seem to be what we should be expecting for the well.

And then if you compare what our EUR is, over what the original-oil-in-place estimate might be for various spacing units, and that would be in that lower table, you can see that for a 40-acre spacing unit we've already produced 183 percent of it. So it's probably draining more than that.

And 80-acre, we're producing 91 percent, which doesn't seem to make sense from a theoretical standpoint.

And finally, if you look at what the oil contained in a 160-acre spacing unit is, we'd be looking at about a 46-percent recovery, which is in line with what we

should be getting from a theoretical basis.

Q. Using all available data in your calculations, then, you come to the conclusion that 160 acres is the appropriate spacing?

A. Yes.

Q. Let's turn back to what are the options for the discovery well at this point, considering its current status. If you'll turn to page 8, let's go through the summary of your options.

A. Okay. At this point in time, first off, we did a little brief of what the current allowables might be. There's a depth bracket allowable for a 160-acre, would be 695 barrels of oil a day, and the order that's currently in place in there would give us 900 barrels a day.

As we've said, the well is currently not capable of producing that. Its rate as of July of this year was about 280 barrels of oil a day and 2000 barrels of water a day.

The options that Conoco has at this point in time to enhance production, the first one would be simply to lower the sub pump. The sub pump is now about 5700 feet above the perfs. If we lowered it an additional 2000 feet, it's been estimated we could pick up an additional 120, 130 barrels a day, which would bring the production rate back up to about 400 barrels a day.

The second option is, we could isolate the water channel. If we isolated the water channel, it's been estimated that the producing oil cut in this well would go from the current 12 percent back up to about 36 percent. That would increase the oil production rate up to approximately 830 barrels a day.

The final option would be to perforate the additional interval to eliminate the convergence flow skin factor that we're suffering right now. And if we did that, opened up the additional 35 feet or so of pay, it's been estimated that the oil rate could actually go up as high as 1650 barrels a day.

Q. Your recommendation to the Examiner is to extend the temporary rules for an additional two-year period?

A. Yes, it is. Conoco does plan on attempting some form of remedial action on this well in the near future. The reason the action hasn't been taken to date is that the sub pump is still operational.

The original estimate was that the sub pump would only operate for about a year before it needed replacement. It's been operating for about 18 months now, and there's some reluctance to go in and work on the well until we actually have to, based on its colorful production history in the past and the luck we've had on the remedial jobs.

So basically we're waiting until the sub pump

fails to go in and attempt these remedial procedures.

Q. Mr. Schulz, are you aware of any adverse data or adverse consequences that would occur if the Division extended the current rules for an additional two-year period?

A. No, I'm not.

MR. KELLAHIN: That concludes our examination of Mr. Schultz. We move the introduction of his Exhibits 1 through 8.

EXAMINER CATANACH: Exhibits 1 through 8 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Schultz, do you know what Conoco plans to do when they go back in?

A. Our hope is that we're going to isolate the water channel and, rather than by cementing off the zone, our plans are, we're just going to set, essentially retainer across the interval and perforate the upper zone and then lower the sub pump. So essentially, we're going to try all three.

The difference is, the -- isolate the water channel, what we originally considered was cementing off the water channel, but there are some concerns about whether that will be successful or not, so we're going to

kind of avoid the issue.

Q. You mentioned something earlier about that this well has produced 900 barrels a day?

A. Yes, on a daily rate for a two-week period, but it's not reflected in the monthly rates.

Q. Okay. And you also mentioned that you didn't think that rate was detrimental to the well at all?

A. No.

Q. And what is that based on?

A. Based on the fact that we weren't seeing any significant pressure depletion. We weren't experiencing any water-coning in the well. The high water production you see in the well now is due to the channel, and not from water coning. And that would have been the only other detrimental effect we could have observed at that time.

Q. Is this basically a one-well deal?

A. Unfortunately, yes. With the Elvis Number 2 well, it was -- the one in Section 17, we said it was located at the oil-water contact. There was some thought by the geologists at the time that it may have actually been slightly below the oil-water contact, and the oil production, when we were observing the well, we were actually coning the oil down through the water.

So this doesn't show it, but there is a fault about 500 feet to the west of the Elvis Number 1 that

isolates it in that direction. There is a second closure of the reservoir to the south of the Elvis Number 1 well, which would cut off any southern extension.

So at this point in time that's all the reservoir requires to produce it, is a single well.

Q. Was the reservoir actually extended to include the Number 2 well?

A. In, I guess, what sense?

Q. Well, I mean, did the Division extend the pool to --

A. No, they didn't, I don't believe so. And also because the well had such a limited production life, we never had an opportunity to come up and discuss that extension. It essentially died out before we would have needed to have brought that to the Commission's attention.

Q. And on your page 7, your reservoir thickness value and your porosity value changed from the original hearing that we had in this case, and that in turn changed your oil-in-place calculation. And can you explain to me why those numbers were changed?

A. We did some additional analysis of the logs, and also we had the logs available from the Elvis Number 2 well, which gave us an indication that as the reservoir went to the north, that there was a thinning of the -- the porosity interval actually thinned, and the average

porosity decreased.

The porosity -- At this point in time when we were seeing that porosity in the zone, that was simply on the log point we had in the Elvis Number 1 well. If we looked at the porosity in the Elvis Number 2 well and took that as the sort of northernmost extension, the average porosity values in the Elvis Number 2 well were probably closer to five percent.

So that's just an averaging between the two data points we have.

Q. And you feel that that's more accurate than your original...

A. Yes, I do.

Q. In terms of producing your estimated ultimate recovery, how long is that time period, do you think?

A. At current rates, about probably two years.

Q. And does Conoco -- Are there going to be any more wells drilled to this Devonian structure?

A. No, this is the only well that will be drilled to this structure. The only way that we would have any additional drilling is if this well failed and we were forced to redrill it to capture the incremental reserves that we think might be in place.

Q. Okay. This looks like a federal lease; is that correct?

A. Yes, it is.

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

Anything further in this case?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: If not, Case 11,773 will be taken under advisement.

(Thereupon, these proceedings were concluded at 8:45 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11773, heard by me on September 16, 1999.

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 September 18th, 1999.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002