

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

EXAMINER HEARING

IN THE MATTER OF: (Reopened)

Case 2635 being reopened pursuant to the provisions of Order No. R-2325, which order established temporary 80-acre proration units for the Inbe-Pennsylvanian Oil Pool, Lea County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre proration units.

Case No. 2635

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

August 7, 1963

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Case 2635

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MR. UTZ: Case 2635.

MR. DURRETT: In the matter of Case 2635 being reopened pursuant to the provisions of Order No. R-2325, which order established temporary 80-acre proration units for the Inbe-Pennsylvanian Oil Pool, Lea County, New Mexico, for a period of one year.

MR. BRATTON: Howard Bratton appearing on behalf of the Applicant. We have one witness.

(Witness sworn.)



WILLIAM J. LeMAY

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATIONBY MR. BRATTON:

Q Will you state your name, occupation and address?

Q William J. LeMay, geologist, 610 Security Building in Roswell.

Q Have you previously testified before this Commission as an expert witness?

A Yes, I have.

Q In connection with the original application in this matter, as a matter of fact?

A That's correct.

Q And you are appearing on behalf of L. R. French, the Applicant in this matter?

A Yes, sir.

Q In this matter you are seeking to have the temporary pool rules made permanent, is that correct?

A That is correct.

Q Including provisions for 80-acre proration units?

A That's correct.

MR. BRATTON: Are the witness's qualifications acceptable?

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MR. UTZ: Yes, sir, they are.

(Whereupon, Applicant's Exhibit No. 1 was marked for identification.)

Q Turn to your Exhibit No. 1, Mr. LeMay, and explain what that is, please.

A This is a map of the Inbe-Pennsylvanian Pool area. I might point out to the north there are two wells which are associated or are within the South Lane Pool, in the hearing on the South Lane Pool which was previously conducted before the Commission, Case 2554.

We have four wells in the Inbe-Pennsylvanian Pools. These are shown on this map and encircled by this dashed line. The figures that I have circled above or beside each well indicate the net porosity within the Bough "C" interval. You'll notice the one well in the general area that is not included in this field is the Sun State "A" well which was at this time in the Bough "C". It is part of the Inbe-Wolfcamp Field.

This map also shows the structural interpretation of the area mapped on the Bough "C" with the contour interval being 25 feet.

Q The dashed line there, those are not the pool limits as delineated by the Commission?

A No, sir, they are not.

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Q That's just your interpretation of the productive limits of this South Lane Pool as known at the present?

A Yes, sir. I just encompassed these three or four wells to differentiate them from the other wells on the map, that dashed line in no way infers a geologic limit or a Commission limit to the pool.

Q And your South Lane Pool immediately to the north, two miles to the north there is also a Bough "C" Pool?

A Correct.

(Whereupon, Applicant's Exhibit No. 2 was marked for identification.)

Q Turn then to your Exhibit No. 2. Is that the field history of the pool?

A Yes, sir.

Q And states substantially what you've outlined, that there are four producing wells and the cumulative production from the pool is 49,340 barrels to date on May 1?

A Correct.

Q It's a typical Bough "C" formation solution gas drive?

A Correct.

Q Possible partial water drive?

A Correct.

(Whereupon, Applicant's Exhibit No. 3 was marked for identification.)



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Q Turn to your Exhibit No. 3, Mr. LeMay. Does that reflect your well completion data showing your initial potentials on these various wells?

A Yes, sir, they do. This in no way indicates the chronological order of drilling the wells. Actually, the French Gulf-State 1 was drilled first and then the 2 and then the Southern Natural and then the Gulf-State 3. The treatment is indicated as well as the perforated interval. I might indicate that the potential is high as compared with the production history in the pool which will be pointed out in further exhibits.

(Whereupon, Applicant's Exhibit No. 4 was marked for identification.)

Q Your next exhibit, then, on the production data, does that reflect the monthly production by well in the pool?

A Yes, sir. This exhibit reflects both the monthly production per well and the monthly field production, and the final column on the right indicates the cumulative production of oil in the Inbe-Pennsylvanian Pool.

Q Is there anything further you care to point out in connection with that?

A No, sir, except I might point out that all the wells produce at less than top allowable rates, in the neighborhood of 100 barrels of oil per day per well.



(Whereupon, Applicant's Exhibit No. 5 was marked for identification.)

Q Your next exhibit, Mr. LeMay, that's your gas and water production in the pool, is that correct?

A That is correct. The gas production is slightly less than the gas production to the north in the South Lane Pool. The water production is slightly higher. We produce approximately two barrels of water for every barrel of oil in all the wells, although they are indicated to be flowing on potential, they all go on the pump.

Q This water production has remained fairly static, is that correct?

A Yes, sir. Well, within the same ratio there I mentioned previously, two barrels of water to one barrel of oil.

Q Turn now to your core analyses, you have a core analysis of each of these wells, is that correct?

A That is correct. Each well drilled in the Inbe-Pennsylvanian Field was cored.

Q Let's start out with the first one there, our No. 1 Gulf State, and explain what it reflects.

A The first well, the Gulf State No. 1 was cored and analyzed by Darrell Smith Company, and the Bough "C" interval I have delineated on the exhibits. You will notice that there is

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a high streak of permeability which extends beyond the measuring equipment of the core laboratory and is indicated to be over 1,000 millidarcies. The porosity reaches a peak of approximately 12% with an average of about six to seven. Oil saturations and water saturations are not believed to be significant because of the high permeability, in which case the fluids were probably flushed from the core before it was analyzed.

Q Go to the core on the No. 2 well then.

A Our No. 2 well has very excellent permeability as well as porosity, and this again reflects the high permeability within the Bough "C". You can see that there is at least one streak that exceeds 1,000 millidarcies, which is greater than the measuring equipment. The same holds true for porosity and water saturations and oil saturations, as I mentioned in the core in the Gulf State No. 1.

Q You have streaks there that are 100 millidarcies?

A That is correct. We have excellent permeability in this well as well as porosity.

Q Turn to your No. 3 well.

A Our No. 3 well has two streaks which exceed 1,000 millidarcies and a very high average permeability as well as the porosity which is averaging close to 7%.

Q Let's go to the Southern Natural well.



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A The Southern Natural well is the furthest north well in the Inbe-Penn field and is fairly tight both in porosity and permeability compared with the three Gulf State wells. You will notice an indicated permeability of 12 millidarcies maximum as well as lower porosity.

Q Actually in the north part of your pool, referring back to your Exhibit No. 1, your formation has just tightened up completely in the Sun well?

A That is correct.

Q And it's real tight in the Southern Natural well?

A That is correct.

Q So that is the northern edge of the pool that is tightening up and your pool just ends shortly thereafter, doesn't it?

A That is correct. It looks as though as you go to the north we are getting a very tight Bough "C" section and so far to the south we've encountered excellent permeability and porosity.

Q This is typical of your Bough "C", isn't it, that's where your pool ends where it tightens up, isn't it?

A That's correct. Most Bough "C" pools have at least one side of the pool that is a permeability barrier which does not allow fluids to migrate any further.

Q Let's go back, then, to your next exhibit after your cores, Mr. Lemay. This is your tabulation of your rock and fluid



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characteristics of the four wells and the average, is that correct?

A That is correct.

(Whereupon, Applicant's Exhibit No. 6 was marked for identification.)

Q Without going through each individual one, your averages show what?

A Our averages show that we have a sufficient net pay to compare with an average Bough "C" pool excellent permeabilities, and the typical Bough "C" drive mechanism which is gas solution, possible partial water drive.

Q You've shown on your permeabilities, Mr. LeMay, that in each of your three wells you have some portion of it where it runs over a thousand, and taking the averages and even throwing in the Southern Natural well you still have an average of 104.3 millidarcies for the pool as a whole?

A That is correct, which is considered excellent.

Q Is there anything else you wish to point out in connection with this?

A No, sir. I think the next exhibit will reflect certain things.

Q Let's to to your next exhibit.

(Whereupon, Applicant's Exhibit 7 was marked for identification.)



A This next exhibit is a comparison of the rock and fluid properties of the Inbe-Pennsylvanian Pool versus the South Lane-Pennsylvanian Pool. The producing formations in both instances is the Bough "C" formation. However, the Bough "C" in the Inbe area is approximately 100 feet deeper than in the South Lane area. We have slightly less gross feet of pay, but approximately the same average net feet. Our porosities are close.

I might point out we calculated our porosities and permeabilities on the basis of core analyses and not on the basis of log analyses, and this would be considered more conservative than the log analysis.

Our water saturation is higher, this is reflected by a higher rate of water production in the Inbe field, our permeabilities compare favorably, both fields have excellent permeability.

Q In there I believe you show in the South Lane that they have 1,069 permeability and you are reflecting yours over a thousand?

A That is correct.

Q Now, those have the big stringers of permeability that you have in each of your three wells?

A That is correct.

Q Your average is over a hundred, taking the whole Bough "C" section?



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A That is true, taking the entire net pay section it averages over 100 millidarcies. The original pressures are close. We have less pressure but we have less gas in solution. The gas in solution, as I mentioned previously, we have less gas in solution and this is reflected through gas production figures. The other factors mentioned here are very close if not identical, the formation volume factor and oil viscosity is the same. The gravity of the oil is very close to the gravity in the South Lane Pool, 47.5 to 46.2.

Q Turn to your recovery calculations which you made, Mr. LeMay. Using the factors you've outlined, you come up with a figure of 77.6 barrels per acre feet in place, is that correct?

A That is correct. Recoverable.

(Whereupon, Applicant's Exhibit No. 8 was marked for identification.)

Q Recoverable, excuse me. 194 in place, 77.6 recoverable?

A Correct, that is per acre foot.

Q Which goes down to the 40-acre and 80-acre calculations at the end there, which are what?

A The oil in place under 40 acres are calculated to be 100,880 barrels; under 80 acres, 201,760 barrels; using a 40% recovery factor, which is considered quite generous in this case because I'm assuming a partial water drive, by using that figure



we come up with recoverable oil under 40 acres would be 40,352, and under 80 acres, 80,704 barrels.

Q If you don't have that water drive it's going to be pretty disastrous, isn't it?

A Very disastrous.

(Whereupon, Applicant's Exhibit No. 9 was marked for identification.)

Q Let's go over to your economics then.

A My final exhibit shows the marginal character of this pool. The cost of drilling, completing and operating these wells is quite high because of the fact they have to be pumped from the start, and Kobe pumps have been used, which are expensive pumps, but they will move the fluid.

I have shown through my calculations that the operating cost per barrel figures close to 45¢ per barrel, the price of crude minus taxes and incorporating the operating cost nets us a price of \$2.37 per barrel. This times the operators net recoverable barrels of oil, and this is assuming a 7/8ths interest lease, this would equal \$83,680 recovered under 40 acres and under 80 acres, the operator could recover \$167,360 under an 80-acre tract. This figure compares with the cost of drilling, completing, equipping and pumping a well which is figured at \$154,720.00. So you can see that the margin of profit involved even under 80 acres



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is very slim.

Q Now, Mr. LeMay, is there any possible way that this pool can be economically drained on 40 acres?

A There is no way.

Q The information which you have available as to drainage is based on the permeabilities of the wells, and does that indicate to you that a well will drain 80 acres in this area?

A Yes, sir, it does.

Q And does this pool compare in its drainage characteristics favorably with the other Bough "C" pools in the area --

A Yes, sir.

Q -- which are on 80-acre spacing?

A Yes, sir, it does.

Q Does that lead you to conclude that one well in this pool will efficiently and economically drain 80 acres?

A Yes, sir.

Q Is it your recommendation that the temporary pool rules for the Inbe-Pennsylvanian Pool be made permanent?

A Yes, sir.

Q Were all exhibits presented here prepared by you, Mr. LeMay?

A Yes, sir.

MR. BRATTON: We would offer in evidence all of



Applicant's exhibits.

(Whereupon, the Applicant's exhibits were offered in evidence.)

Q (By Mr. Bratton) Do you have anything further you care to state in connection with this matter?

A I might mention that the Case No. 2554 which was heard by the Commission June 5th and granted on the Commission Order No. 2554 is very similar in every respect to our Inbe-Pennsylvanian Pool and it looks as though the pools will be separated only by a possible permeability barrier which is starting to be reflected in the north end of our pool. Besides this the conditions and operation in both pools are almost identical.

Q That's the South Lane Pool and this one?

A The South Lane and Inbe-Penn, yes, sir.

MR. BRATTON: We have nothing further at this time.

CROSS EXAMINATION

BY MR. UTZ:

Q Do French or anyone that you know of have any more plans for drilling any more wells in this area?

A Yes, sir, we have plans for starting the No. 4 well.

Q Where would it be?

A Approximately 1980 from the south and 660 from the west line of Section 18. This well will probably be started around the

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first of October.

Q You feel that the pool extends to the south?

A Yes, sir, I do.

Q How deep are these wells?

A They vary between 9800 and 9900, approximately.

Q That was 660 from the west of Section 18, 1980 from the south?

A That is correct. We have a checkerboard 80 pattern in the field with Gulf. Gulf owns the non-drilled 80 acres.

Q You feel that you have a partial water drive here?

A Yes, sir, I do.

Q So you haven't attempted any interference tests?

A No, we have not.

Q Is that the reason?

A That and the economical aspect of the pool itself. We are hesitantly drilling wells because of the economic recoveries this far.

Q What would economics have to do with running of the interference test?

A Possibly the cost of the interference test and the possible loss of production.

Q You realize in other pools we have granted transfer of allowables as far as loss of production is concerned?



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A Yes, sir. All wells currently in the pool are producing at less than top allowable rate and there can be no recovery of production from other wells.

Q I see. They're all marginal wells then?

A That is correct.

MR. UTZ: Are there any other questions of the witness?

MR. DURRETT: None.

MR. UTZ: The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements to be made in this case?

The case will be taken under advisement. We'll take a recess.

(Whereupon, a recess was taken.)



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STATE OF NEW MEXICO)
) SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 21st day of August, 1963.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2635, heard by me on *Aug 2* 1963.

[Signature], Examiner
New Mexico Oil Conservation Commission.

