

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 11, 1962

EXAMINER HEARING

IN THE MATTER OF:

Application of L. R. French, Jr. for an order creating a new pool and establishing temporary rules or extension of the South Lane Pennsylvanian Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order creating a new pool for Pennsylvanian production; the discovery well for said pool is the Gulf-State Well No. 1, located in Unit A of Section 18, Township 11 South, Range 34 East, Lea County, New Mexico, completed in the Bough "C" zone of the Pennsylvanian formation. Applicant further seeks establishment of special rules and regulations governing said pool, including 80-acre proration units. As an alternative, applicant seeks extension of the South Lane Pennsylvanian Pool to include said Gulf-State Well No. 1.

Case 2635

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 2635.

MR. DURETT: Application of L. R. French, Jr. for an order creating a new pool and establishing temporary rules or extension of the South Lane Pennsylvanian Pool, Lea County,

New Mexico.

MR. BRATTON: Howard Bratton appearing on behalf of the applicant. We have one witness, Mr. LeMay.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 1 through 11 were marked for identification.)

WILLIAM J. LEMAY

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

DIRECT EXAMINATION

BY MR. BRATTON:

Q Will you state your name and occupation?

A William J. LeMay, consulting geologist.

Q You consulted Mr. French in connection with the matters under consideration in this application?

A Yes, sir.

Q Have you testified before this Commission previously?

A No, I have not.

Q Please state briefly your professional and educational background.

A Bachelor of Arts degree from Carlton College in 1955, major in geology, a Master of Science degree from the University

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of Michigan in 1956. I have worked three years for Pan American in Roswell and Lubbock and three years for Hondo Oil and Gas Company in Roswell, New Mexico, and four months as a consulting geologist.

Q And you have been consulting on the well in question and the area in question in this application?

A Yes, sir, I have.

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

MR. UTZ: Yes, sir.

Q Mr. LeMay, what is Mr. French seeking in this application?

A We would like to have temporary rules for 80-acre spacing and 80-acre allowable with a flexible spacing in this one well field, which is producing from the Bough C formation of the Pennsylvanian.

Q This is another Bough C Pennsylvanian discovery and it's approximately two miles south of the South Lane Pool, is that correct?

A That is correct.

Q And that's another of the Bough C Pennsylvanian pools?

A That is correct.

Q Identifying the area in question and the well specifically,



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refer to your Exhibit No. 1, Mr. LeMay.

A Our well is located in Section 18 of Township 11 South, Range 34 East, 660 feet from the north and the east line. It was a wildcat location and it flowed oil from the Bough C formation.

Q That's the area colored in yellow?

A That is correct.

Q And the area circled in green to the north of it is the South Lane Pennsylvanian Pool?

A That is correct.

Q The Bough C Pool likewise? A That's right.

Q What else do you care to state about that exhibit, Mr. LeMay?

A It shows the ownership in the surrounding areas as well as the 80 acres allocated to the discovery well.

Q That's the 80 acres that we would like to allocate to it?

A Correct, that we would like to allocate.

Q Turn to your Exhibit No. 2 and explain what that is.

A Exhibit 2 is a structure map contoured on top of the Bough C formation, the subject area. The contour interval is 50 feet. The area extends up through the South Lane field, which likewise produces from the Bough C formation, Case No. 2554.

Our position and our well is very comparable to the area of the



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South Lane field. As you can see, the well lies on what I feel is relatively steep dip and pinches out on top of the structure.

Q There's no control, of course, between here and the South Lane Pool and we don't know whether there are permeability barriers in there or not, is that correct?

A That is correct.

Q It's conceivable that the two areas could connect or there could be areas of no permeability in there?

A That is correct. There's no control. There's no way to tell.

Q Is there anything further you care to explain geologically from this structure map, Mr. LeMay?

A I would like to point out the fact that we are at approximately the same structural position on the steep dip as wells to the north. We are 180 feet low to the high wells, but this has been proven to be an area of steep dip. Therefore, our structural position is comparable to the field to the north. The structures run north-south in that area.

Q I don't believe they are included in the folio, but the Examiner has copies of Exhibits 3, 4 and 5 which are logs of this well, is that correct?

A That is correct.

Q What are those logs and what have you marked on that?



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A We have run a gamma ray acoustic log, a lateral log and a microlateral log. The gamma ray acoustic log has the top and the base of the Bough C formation written on them. The reservoir calculations were derived in part from the logs we ran, and in part from a core analysis. We did core the Bough C formation.

Q In part, based off of those logs, you have devised some of your information that you will use later in the case, is that correct?

A That is correct.

Q Is there anything further depicted on those three logs that you care to bring out?

A No, sir, except that the logs do show water saturations which were included in here, as well as the gross Bough C interval.

Q Turn to your Exhibit No. 6, Mr. LeMay, which is your well history of the well in question. Go briefly through the significant parts of that, please.

Q The well was drilled to a depth of 10,500 feet; the Bough C formation was cored and drill stem tested, the results are as follows: There was a strong blow throughout. The test tool was open 3 hours 20 minutes, gas surfaced in 2 minutes, mud in 2 hours 10 minutes, oil in 2 hours 17 minutes. It flowed to the pits for 15 minutes, to the tanks for 48 minutes. However, there was no gauge because the well barely flowed. We reversed out



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15 barrels of fluid, 15% of which was water, and recovered 30 feet of heavy oil and gas cut drilling mud below the sub. The 30 minute shut-in pressure was 3510 pounds. The 1½-hour final shut-in pressure was 3310 pounds; the flow pressures, 520 and 1870 pounds. The pipe was set, 4½" casing was set to a depth of 9986'. The well was perforated between 9867 and 9875. It was washed with 500 gallons of mud acid. Then on August 19, 1962 the wells flowed 322 barrels of oil and 198 barrels of water through a 26/64" choke. Gravity of the oil was 44 gravity. Initial reservoir pressure test was made, a bomb test, the pressure was 3384 pounds.

Q Let's go, then, to your reservoir characteristics of your rock and fluid. That's your Exhibit No. 7, Mr. LeMay. What does that reflect?

A This reflects in general the properties of the Bough C as encountered in our well. The top of the Bough C is at 9862. We have a gross pay thickness of 21 feet, a net pay thickness of 9 feet, porosity averaged out is 7.2%, the average water saturation through the interval is 29%, the average permeability, again a weighted average of core analysis, is 115 md.

The other information consists of the reservoir temperature which was reported at 156 degrees Fahrenheit, formation volume factor of 1.88, oil viscosity of 0.18, gravity of the oil, 44



degrees, and as I mentioned previously, the original reservoir pressure, 3384 pounds.

Q Your core analysis is your last exhibit here off of which you derived your porosity and your permeability, is that correct?

A That is correct.

Q And your net pay?

A I would like to point one thing out at this time. On the core analysis that there was a 16 foot depth correction factor between the depths, the drilling depths as shown on the core analysis and the log depths. This was an error in the drilling.

Q Now, Mr. LeMay, based on that, what recoveries have you calculated for this Bough C Pool?

A Assuming an average porosity of 7.2%, water saturation of 29%, net pay of 9 feet and recovery factor of 40%, because I believe we have water drive although there's still insufficient evidence, other fields in the area producing from the Bough C have shown to be water drive, so that is the assumption in this case. I have calculated 208 barrels per acre foot oil in place, 83.2 barrels per acre foot recoverable oil, 1,872 barrels per acre oil in place, 748.8 barrels per acre recoverable oil.

Oil in place under 40 acres, 74,880 barrels; under 80 acres, 149,760 barrels; recoverable oil, 29,952 barrels under 40 acres;

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59,904 barrels under 80 acres.

Q Turn then to your next exhibit, Mr. LeMay.

A The next exhibit is a comparison of the rock and fluid properties in our L. R. French, Jr. No. 1 Gulf State and the T. F. Hodge well which was a discovery well in the South Lane field, Case No. 2554.

Q That's the pool just immediately to the north that we've depicted on our first exhibit there?

A That is correct.

Q Go ahead.

A The depth of the Bough C formation in our L. R. French well, 9862 feet as compared to 9607 feet in the T. F. Hodge well. Gross pay, we had 21 feet, the Humble State well, 30 feet. Our net pay was 9 feet, theirs was 16 feet. Porosities were the same, 7.2%; water saturations, our calculations 29%, their well 15%, although in the hearing they thought this factor was quite a bit too low. Our permeabilities averaged 115 millidarcies, theirs 94. Original reservoir pressure, 3384 and our well 3473; in the Hodge well, gas in solution, we had this calculated from DST, which is a very estimated calculation, 1220; T. F. Hodge GOR is 1550. Our original reservoir pressure, 156, in the Humble State 143. Formation volume factors are the same, 1.88. Oil viscosity, same, 0.18. Our gravity, 44 degrees API, theirs,

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47 degrees.

Q So, on a comparison of the two areas, this area showed at least as well and probably better from a drainage standpoint, is that correct?

A That's correct. We had a greater average permeability than their well although our net pay thickness was lower.

Q So we should be able to drain as wide an area and probably wider, but our recoveries don't look as good?

A That is correct.

Q So our economics are, to say the least, are not too optimistic?

A No.

Q Let's turn, then, to those, Mr. LeMay, on Exhibit No. 9.

A No. 9 compares the economics of drilling on 40 acres as compared with drilling on 80-acre spacing pattern. Recoverable oil in barrels as given previously under 40 acres, 29,952 barrels. Under 80, 59,904 barrels. Assuming a 7/8 interest lease which is very optimistic because the majority of operators do not have that, it nets out 26,218 barrels under 40 acres and 52,436 barrels under 80 acres. Taking a price of \$3.01 minus the taxes which are figured at .18¢ per barrel and the trucking at .12¢ per barrel, that would leave a net price per barrel of \$2.71. This times the recoverable oil under 40 acres would be \$71,051; under 80 acres,



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\$142,102. The cost of drilling our first well was one hundred -- of drilling, testing and completing the first well was \$147,986. To this we add a cost of tank battery and flow lines, \$7,840, and we were just in the process of installing a pump, a KOBE pump, which will cost \$19,107, which gives a total cost of \$174,933.

Because this well went to 10,500 feet and we did core and test it quite a bit more than we would a field well, we estimate that subsequent development in the area would be in the neighborhood of \$134,000 per well.

Q Mr. LeMay, the way this comes out, even on 80 acres a well would appear to be either no profit or a losing proposition?

A That is correct.

Q But that assumes that all locations in the pool were simultaneously drilled, is that correct?

A That is right.

Q Is it your estimate that this pool, as with the other Bough C Pools, North Lea County and South Roosevelt, drain actually over tremendous areas?

A I think that's been proven in previous Commission hearings, that there is evidence that one Bough C well will drain a very large area.

Q So we do hope to make some profit on the wells. We are



not going to drill them to lose money, is that correct?

A That is correct. Also I would like to point out that we only had 9 feet of net pay in this well. We do hope subsequent development will produce a larger pay section than 9 feet, which is probably slightly below the average pay in the Bough C as a formation.

Q Most of those Bough C Pools have come closer to 15 feet?

A That is correct, 12 to 15 feet could be considered average.

Q Is there any question in your mind but what one well in this pool will efficiently and economically drain 80 acres?

A No, sir.

Q As a matter of fact, it would drain considerably more than 80 acres, is that not correct?

A That is correct.

Q In your opinion would the drilling of wells in this pool on 40 acres result in economic waste?

A It certainly would.

Q In your opinion, Mr. LeMay, would the granting of this application for temporary 80-acre spacing in this pool result in prevention of waste and the protection of correlative rights?

A Yes, it would.

Q Mr. LeMay, in your judgment, is it advisable to have

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both flexible spacing and locations in this proposed pool?

A Yes. I think it's been proven in the past that flexibility in location is very desirable in developing Bough C Pools.

Q That has been or has become pretty well accepted in the field rules that have been established for subsequent Bough C Pools, is that correct?

A That is correct. It was granted in the South Lane field to the north of us.

Q I believe your last exhibit was just the core analyses we referred to previously, is that correct?

A Yes.

Q Is there anything further you care to state in connection with this application, Mr. LeMay?

A No, sir.

Q I believe you would anticipate the 80-acre proportional depth factor for the nine to ten thousand feet since this was a discovery well and it was topped at approximately 9800 feet, is that correct?

A That's correct.

Q Were each of these exhibits prepared by you or under your supervision?

A They were prepared by me.



MR. BRATTON: We would offer in evidence Applicant's Exhibits 1 through 11, I believe it is, inclusive.

MR. UTZ: Without objection Exhibits 1 through 11 will be entered into the record of this case.

(Whereupon, Applicant's Exhibits 1 through 11 were entered into evidence.)

MR. BRATTON: We have nothing further at this time, Mr. Examiner.

CROSS EXAMINATION

BY MR. UTZ:

Q Would you expect this pool to be very wide from east to west?

A It's hard to say at this time, Mr. Examiner. I wouldn't expect it to be over two miles wide at this time.

Q What type of structure would you classify it as?

A I would call this a stratigraphic trap with the evidence we have to date. I think that there has been one well drilled in Section 22 of 10, 33 in the southeast corner, which was high enough to produce, but which encountered shale in the normally porous Bough C formation. Therefore, on the basis of this well and this well alone, I think the Bough C porosity pinches out to the west and also carries proportionately more water down dip. The Humble well in the South Lane field, the discovery field, was a

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water-free completion. We are currently producing approximately 30% water in our well.

Q And you feel that if there is a water drive, it's from down structure?

A Yes, sir.

Q Is it unusual for stratigraphic traps to also have water drive?

A No, sir. I think the Allison is in part stratigraphic, as a classic example of this type situation.

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

The witness may be excused.

(Witness excused.)

MR. UTZ: Are there other statements in this case?

MR. BRATTON: No, sir. I would make one statement, I believe, we sincerely hope it's a water drive, if it isn't we are in trouble.

MR. UTZ: The case will be taken under advisement.

Let's take a ten-minute recess.



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 2nd day of October, 1962.

Ada Dearnley
 Notary Public-Court Reporter

My commission expires:

June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2625 heard by me on Sept. 25, 1962.
Thurman D. [Signature], Examiner
 New Mexico Oil Conservation Commission

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