

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 10, 1962

EXAMINER HEARING

IN THE MATTER OF:

Application of Cabot Corporation for the crea-)
tion of a new oil pool and the establishment of)
temporary rules and regulations, Lea County,)
New Mexico. Applicant, in the above-styled)
cause, seeks the creation of a new oil pool to)
be designated the North Bagley-Wolfcamp Pool)
for its Humble State Well No. 1, located in)
the NW/4 NW/4 of Section 23, Township 11)
South, Range 33 East, Lea County, New Mexico.)
Applicant further seeks establishment of)
temporary rules and regulations governing said)
pool including provisions for 80-acre proration)
units.)

CASE 2659

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: Call 2659.

MR. DURRETT: Application of Cabot Corporation for the
creation of a new oil pool and the establishment of temporary rules
and regulations, Lea County, New Mexico.

MR. BRATTON: Howard Bratton on behalf of the Applicant.
We have one witness, who has already been sworn.

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

W. M. SARGENT, JR.

called as a witness, having been first duly sworn on oath, testi-
fied as follows:



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DIRECT EXAMINATION

BY MR. BRATTON:

Q Are you the same Mr. Sargent who testified in Case 2658?

A I am.

Q Mr. Sargent, in Case 2659 we are talking about the same area and the same wells we were talking about in 2658, isn't that correct?

A That is correct. The well in question here is the southeast offset to the Dallas, our Humble State No. 1 located in Section 23, 11, 33, Lea County.

Q It's producing from an undesignated Wolfcamp Pool, is that correct?

A That is correct.

Q And you are seeking in this case temporary 80-acre pro-
ration units for this formation in this pool?

A Yes.

Q Turning to your Exhibit No. 1, page 1, the location of the well is reflected on there, is that correct?

A That is correct.

Q And that's the well that Mr. Nutter determined is the only well producing from the Wolfcamp --

A Yes, sir.

Q -- in this area. Turn to your next page, Mr. Sargent. This is the well history of the Humble State No. 1, the Wolfcamp well?



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A Yes, sir.

Q Go through that briefly.

A This indicates a drillstem test in which we recovered oil. The oil surfaced five minutes after being shut-in for final shut-in pressure. The well was drilled on down through the Upper Penn section, and subsequent to running pipe on the well, the lower zone of the Upper Penn was perforated 9446 to 9452. This well was potentialized for 238 barrels of oil and 102 barrels of water per day. After being produced for something less than a month, the well, the water production increased on this well until it died, and we plugged the zone off, temporarily abandoned the zone and came back up and perforated 8668 to 8679 and 8684 to 8689 in the lower Wolfcamp. This well was potentialized for 156 barrels of oil and no water, on 11/64 inch choke. GOR of the well was 1315 to 1. Gravity of the oil, 50 degrees API. Initial reservoir pressure by bottomhole pressure was 3112 at 8600 feet.

Q Your next exhibit is your log of this well, is that correct?

A It is the log of the Wolfcamp section in this well. I did not include the lower zone on this well. It's included on the cross section, however.

Q It shows the perforation and it shows the bridge plug, is that correct?

A Yes, sir, the bridge plug set at 8710.

Q Anything else you care to bring out in connection with



that?

A The areas of net porosity I've picked are shown in dark blue on the sonic log. They amount to some twenty-six odd feet.

Q Turn to your next exhibit. Is that the same cross section --

A Yes.

Q -- that we discussed in connection with 2658?

A Yes, it is.

Q Is there anything additional or peculiar to the Wolfcamp that you want to bring out in connection with the hearing on this formation?

A The Wolfcamp was proved by drillstem test to be continuous in Cabot's three wells. The Humble State is the only well producing from the Wolfcamp zone at this time.

Q Actually, are the other wells on the cross section significant insofar as the Wolfcamp is concerned?

A No, sir, they are not. I believe there are one or two, maybe three wells in the Bagley Field which are producing from the Wolfcamp but they have not been spaced.

Q Going to your next exhibit, your oil recovery calculations, here again you have no cores and a good deal of your information is based on logs and calculations from your PI tests, is that correct?

A The information shown here is based upon logs. The



porosity, average porosity through the zone was 5.7 percent; the water saturation was estimated to be 20 percent, this was based upon my knowledge of the Wolfcamp and other areas in Lea County. The net pay was 26 feet from the log, and the recovery factor, I used 30 percent, once again based upon recovery from the Wolfcamp and other areas of Lea County.

Standard oil in place and recoverable oil calculations show 58.7 barrels per acre foot recoverable, or 1,525 barrels per acre. Recoverable from 40 acres, 61,000 barrels; recoverable from 80, 122,000 barrels.

Q What kind of drive mechanism is this?

A I assume that this would be a solution gas depletion type drive.

Q So your 30 percent is reasonably optimistic?

A It's very optimistic for depletion type drive.

Q Let's go to your next page, your reservoir rock and fluid properties.

A The Wolfcamp zone was found approximately 8670 feet. Gross pay, 56 feet; net pay, 26 feet. Porosity, 5.7 percent, and assumed water saturation of 20 percent. Original reservoir pressure, 3112, saturation pressure 2700 psi, this from Standing's charts. Reservoir temperature, 159 degrees measured. Solution gas-oil ratio, 1315, this was based on the potential and ratio produced from the formation volume factor. This again was based on Standing's charts. Oil gravity, 50 degrees API.



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Q Go to your next table, your comparison of the rock and fluid properties in this well with those in the North Anderson Ranch Wolfcamp.

A I used the North Anderson Ranch Wolfcamp Pool for comparison as it was the nearest Wolfcamp which had been spaced on 80 acres that I was able to find in the Commission's rules and regulations, nomenclature. The depth of the North Anderson Ranch is some 1300 feet below the Humble State; however, both zones are the Lower Wolfcamp. The gross pay in the North Anderson Ranch is 80 to 100 feet, some one and a half to two times as much as found in Cabot. The net pay in North Anderson Ranch ranges from 17 feet to 64 feet, while ours is 26. Porosity in North Anderson Ranch is 9.6 percent, and Cabot's from log analysis is 5.7. Water saturation is 25 percent in North Anderson Ranch; Cabot's well is 20 percent, estimated. Permeability in the North Anderson Ranch, based upon data presented at their spacing hearing, was from 5 to 100 millidarcys. We have not run a PI test on this well and the only data I had to work with was the drillstem test, and the calculated permeability was 0.5 millidarcys.

The productivity index of the North Anderson Ranch Pool is .458. The original reservoir pressure, 3600+ for the North Anderson Ranch, which is some 500 pounds higher than Cabot's well. However, the depth would account for that.

Saturation pressures are different. The solution gas-oil ratio, ours is somewhat lower than North Anderson Ranch,



resulting in the lower saturation pressures. Temperatures, probably about the same. Formation volume factor, North Anderson Ranch, 1.96; on Cabot's 1.81, this difference being accounted for by the higher gas solution ratio on the North Anderson Ranch. Oil viscosity, .225 for the North Anderson Ranch, and .18 for Cabot. Oil gravity, 41.7 for North Anderson, while ours is 50 degrees.

Q Let's go back to your permeability in this well. Do you believe your .5 there is probably truly reflective of the permeability?

A No, I do not. As I say, this was calculated from the drillstem test on which we did not have a flowing recovery, actually, during the open period of the test. Calculations of the drillstem test indicated that this permeability represents an area maybe five feet around the well bore. This would be the area which would be contaminated by mud during drilling, resulting in reduction in permeability; flushing of the zone by water and reduction of permeability to oil in this area. The well on subsequent tests has flowed at rates in excess of 20 barrels of oil per hour, with flowing pressures of about 1400 psi. In order to recover oil at these rates, I believe that the permeability has to be much higher within the drainage area of this well.

MR. NUTTER: Would it have to exceed .5 of a millidarcy?

A Yes, sir.

Q (By Mr. Bratton) So you are confident that your



permeability is substantially higher than your .5 of a millidarcy?

A Yes, I believe it is.

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

A No, sir.

Q Let's go to your next exhibit.

A The next exhibit is a plot of the average reservoir bottomhole pressure for the North Anderson Ranch Pool versus time, and indicated on it is the pressure of one well from 1958 up to 1961, and then the last point indicates the average pressure of eight wells in this reservoir. This plot indicates that there is good pressure communication between these eight wells.

Q Let's turn now to your drilling economics on the Wolfcamp.

A The recoverable oil under 40 acres, 61,000; under 80, 122,000. Operator's net, \$53,375 under 40; \$106,750 under 80 acres. Operator's net income, once again giving the top price of \$3.01 per barrel in the area plus seven cents per thousand on gas, times recoverable oil gives \$155,855 for 40 acres, and \$311,710 for 80 acres. The drilling and completing of the Humble State No. 1 was \$154,112.. This includes completion, the actual completion in the Upper Penn, and also the attempted completion in the upper zone of the Upper Penn, which failed. Flow line and tank batteries estimated to cost \$11,369, for a total of estimated cost of \$165,481. I estimated that the producing Wolfcamp well,



completed, would cost \$135,000, plus tank battery. This indicates that on 40 acres it's at most a break-even proposition, trading dollars; and on 80-acre spacing it would be a two to one return. Once again, I have not included operating costs in my calculations.

Q In connection with possible dual completions, as you've testified previously, if you were fortunate to be able to dually complete in the Wolfcamp and the Upper Penn, on 80 acres you would still have an outside of two to one recovery, roughly, is that correct?

A That is correct.

Q On 40 acres?

A Less than two to one.

Q It would be in the range of one and a half to one?

A Yes, between one and a half and two to one.

Q Here again you are asking for temporary one-year rules, is that correct?

A Yes, sir, I am.

Q During that year, would you be willing to run interference tests in the Wolfcamp?

A Providing other completions are made in the Wolfcamp in the area, we will do whatever is required to prove adequate communication between the wells on 80-acre spacing.

Q And if you drill any additional Wolfcamp wells in the area, would you be able to take cores and have that information available?



A I would certainly attempt to convince our Production Department that we should do so.

Q Is there anything further you care to state with relation to these exhibits?

A Not with the exhibits, no.

Q Based upon the analysis you've made of this pool, in your estimate would a one-year order for 80-acre proration units be in the interest of conservation and prevention of waste?

A Yes, sir, it would.

Q Would the drilling of wells on 40 acres during that year in your estimation result in economic waste?

A Yes, sir, I believe it would.

MR. BRATTON: We would offer in evidence Applicant's Exhibit 1.

MR. NUTTER: Cabot's Exhibit 1 will be entered in evidence.

(Whereupon, Applicant's Exhibit No. 1 entered in evidence.)

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Sargent, are you requesting the same flexible pattern for spacing here that you requested in the previous case?

A Yes, sir, we are requesting the same pattern and the increased acre, 80-acre depth allowable.

Q 150 feet from the center of the tract dedicated to the well?



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A Yes, sir.

MR. NUTTER: Any questions of Mr. Sargent?

MR. BRATTON: I believe one further thing, Mr. Nutter. We would request exceptions to any of these existing wells that are closer to the line than the 150 from the center.

MR. NUTTER: You'll have to have an exception or pull them up and move them.

MR. BRATTON: That we would very much not like to do.

MR. NUTTER: If there's no further questions of the witness, he may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further you wish to offer in Case 2659, Mr. Bratton?

MR. BRATTON: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in this case? We'll take the case under advisement.

* * * * *



STATE OF NEW MEXICO)
) ss
 COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me in stenotype, and that the same is a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 25th day of October, 1962, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
 NOTARY PUBLIC

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. 2659 heard by me on 10/31, 1962.

[Signature]
 Examiner
 New Mexico Oil Conservation Commission

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