BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 24, 1967

EXAMINER HEARING

IN THE MATTER OF:

Application of Aztec Oil and Gas Company for special pool rules, Lea County, New Mexico.

Case No. 3573

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 3573.

MR. HATCH: Application of Aztec Oil and Gas Company for special pool rules, Lea County, New Mexico.

MR. SWANSON: If it please the Examiner, I am Kenneth A. Swanson, member of the Texas Bar, appearing as attorney for Aztec Oil and Gas Company. I believe the case file will show that appearance has been entered in our behalf by local counsel.

MR. UTZ: I have a communication here from Montgomery, Federici and Andrews.

(Whereupon, Applicant's Exhibits 1 through 7 were marked for identification.)

MR. SWANSON: We have one witness in this case.

(Witness sworn.)

PRENTICE R. WATTS

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

DIRECT EXAMINATION

BY MR. SWANSON:

Q Will you please state your name, by whom you are employed and in what capacity?

A My name is Prentice Watts. I am employed by Aztec Oil and Gas Company in Dallas, Texas, Vice President for Production.

Q This is a hearing with respect to Aztec's application for 160-acre spacing of the Strawn oil pay in the South Corbin area. Would you generally describe this area, Mr. Watts?

A The South Corbin Strawn Oil Pool is located generally in Section 21, 22, 27 and 28 of Township 18 South, Range 33 East, Lea County, New Mexico. The pool produces from the Strawn formation at a depth of about 12,300 feet. This map which I wish to submit as Exhibit No. 1 shows land ownership, shows Strawn well locations and geological contours on top of the Strawn formation. Only three wells in the immediate area have penetrated the Strawn, they are the Uncle No. 1, located Northeast-Northwest, Section 28, the Federal "M" No. 1, located Northwest-Southwest, Section 27, the Federal "MA" No. 1, located Southwest-Northeast, Section 27, all in Township 18 South, Range 33 East.

The Federal "MA" No. 2, located Northeast-Southeast of Section 21 is currently drilling below 10,800 feet and is projected as a dual completion in the Morrow and Strawn formations. All of these wells are operated by Aztec. Two wells are currently producing from the Strawn, the Federal "M" No. 1 and the Federal "MA" No. 1. Both are dually completed in the Morrow gas zone and the Strawn oil zone.

The Morrow, found at a depth of 13,300 feet, is the

more valuable of the two zones and was the primary objective for the two wells. Geologically the Strawn formation is a member of the Upper Pennsylvanian system and dips regionally to the Southeast. The Strawn is generally a carbonate rock interspersed with shale stringers and there are occasional sand buildups as well as reef-type deposits within the zone. The South Corbin area is such a sand deposit. It's a medium grained angular quartzitic sand with a dolomitic cementing material. The zone is presumed to be a beach-type deposit on the Northwest flank of a local structural high.

Now, this structure is indicated on our Exhibit 1 by contour on top of the Strawn. The lateral extent of the sand is not known though it's likely of limited extent. This cross section, which I shall call Exhibit No. 2, was prepared from gamma ray sonic logs of the three wells in the pool. The cross section runs from the Uncle No. 1 eastward to the Federal "M", thence to the Federal "MA" No. 1. On the cross section I've indicated the top of the Strawn formation. It's shown in green, the producing zone, the porous sand interval is shown in red and perforations in the three wells are shown by red blocks. You can see this is a thin sand with a gross thickness of some six to ten feet, but it is apparently continuous between the wells.

Our Exhibit No. 3 is a summary of reservoir data.

Reading from the exhibit, the average porosity is 15%, permeability up to 25 millidarcies, average water saturation, 25%, average net pay in the area, five and a half feet, and estimated formation volume factor, 1.70; initial reservoir pressure was 7128 pounds per square inch, the oil gravity on the surface is 46 degrees API, the initial gas-oil ratio was 1600 cubic feet per barrel.

Q Mr. Watts, have you made a study of the area that one of these Strawn wells could reasonably be expected to drain in an efficient and economical manner?

A I believe each well will reasonably be expected to drain 160 acres. The cross section, our Exhibit No. 2, indicates the probability of a continuous sand zone. Now, the initial bottomhole pressure of the Federal "M" No. 1 was 7,128 psi. This is an extrapolated pressure from a drill stem test taken on December 19th, 1966; the same type of bottomhole pressure on the Federal "MA" No. 1 was 6,862 psi on March 3rd, 1967. Now that's some 266 pounds lower than the Federal "M" No. 1.

MR. UTZ: What did you say the No. 1 was?

THE WITNESS: Federal "M" No. 1 was 7,128.

MR. UTZ: Thank you.

A During the elapsed time between these two pressures in the two wells, the Federal "M" No. 1 produced about 21,000

barrels of oil. It is likely that the difference in bottomhole pressure is because of production from the Federal "M" No. 1.

Now, if this is true it might be assumed that some 450 acres may have been affected by production from the Federal "M" No. 1. This assumption is based on the fact that the two wells are about 2500 feet apart, and if withdrawals from the Federal "M" caused a reduction in pressure at the Federal "MA" No. 1, then we can consider a possible circular area of drainage with a radius of 2500 feet. Such a circle would contain about 450 acres. This is an area much larger than the proposed 160-acre spacing requirement.

Another point that should be considered in establishing a drainage area is cumulative production from the Federal "M" No. 1. To establish that point I would like to refer you to Exhibit No. 4, which is a summary of estimated reserves of an average Strawn well in this area.

Now, these estimated reserves are based on volumetric calculations, using our basic reservoir data obtained from electric logs, drill stem tests, one core analysis and estimated data and an assumed recovery factor of 20%, and they're used as perameters.

Q And they use these perameters as the information shown on Exhibit 3, is that correct?

A That's correct. Reading from the summary of

estimated reserves we believe that the recoverable oil in this area would be about 565 barrels per acre, or for 160-acre tract, 90,400 barrels recoverable gas, that is casinghead gas, will be about 3,846 MCF per acre or 615,000 MCF per 160-acre tract.

Now, I will refer to Exhibit No. 5. This exhibit indicates that the Federal "M" No. 1 has produced about 44,000 barrels of oil since its completion in January of this year. Now, assuming this well has drained about 565 barrels of oil per acre as shown on Exhibit 4, plus the gas, then I think it may reasonably be assumed that the well has already drilled about 80 acres.

The well continues to produce top allowable of 324 barrels per day and is capable of producing at least 350 barrels a day. We haven't tested it at a higher rate recently. I presume it can drain at least another 180 acres.

I believe another comparison can be made. The Commission has previously granted 160-acre spacing for the Lusk Strawn Pool. I think it should be pointed out that the South Corbin Strawn Pool and the Lusk Pool possess some similar characteristics, porosity and particularly permeability are of the same magnitude. The Lusk Pool contains a much thicker pay, better pool. The drainage characteristics are somewhat comparable and I think this point should be considered when assuming the drainage area in the South Corbin

area.

One other point aside from drainage should be considered. That is economics. Our Exhibit No. 6 briefly summarizes the economics of drilling a Strawn oil well. Reading from the summary of economics, we estimate the cost of a single Strawn oil well to be $201,000. Now, remember, this is a well of some 12,300 foot depth. We receive a net price for the oil after deducting royalty, taxes, trucking or pipeline charges, we receive $2.25 a barrel, net. The net price for gas also after deducting royalty, taxes and handling is about seven and three-quarters cents per MCF.

We estimate the operating costs for a Strawn oil well over its life to be up at least $9,600. Using those figures, we believe the total of all of products that could be obtained from 160-acre spaced Strawn oil well would be $251,200. Subtracting your operating costs and the cost of a Strawn well we come up with an indicated net profit of $40,600, and this is an undiscounted net profit. So, you see, in any event the drilling of a Strawn well is fairly marginal.

Q Do you have any recommendations to make with respect to the rules that should apply to this South Corbin Oil Pool?

A Yes. Our Exhibit No. 7 lists special rules and regulations that we recommend for the pool. I shall briefly

summarize these rules. First, we think the spacing should be 160 acres and the proration unit should comprise a governmental quarter section. Further, we recommend that the wells be spaced or located within the proration unit not closer than 660 feet to any quarter section line, nor closer than 330 feet to any quarter, quarter section line.

We recommend that the Secretary-Director of the Commission have authority to grant administrative approval for exceptions to the spacing, that is, insofar as a non-standard unit is concerned and unorthodox location caused by topographical conditions. We further recommend the limiting gas-oil ratio in the pool of 4,000 cubic feet per barrel of oil. I did not testify supporting this ratio. I might point out that the Federal "M" No. 1 had an initial gas-oil ratio of 1600 cubic feet per day, in the five months it's produced the ratio has increased to about 1900 cubic feet. We feel that it will continue to increase so we recommend the 4,000 to 1 ratio.

Q The gas-oil ratio of that well is 1600 cubic feet of gas to one barrel of oil?

A Yes. In any event, there will be no flaring of gas because we already have a gathering system and it's in operation for gathering casinghead gas.

One last recommendation, we recommend that the

160-acre proration unit be assigned a proportional factor of 7.75 for allowable purposes.

Q Mr. Watts, were these exhibits prepared by you or under your supervision?

A Yes.

MR. SWANSON: We would like to offer Aztec's Exhibits 1 through 7 at this time.

MR. UTZ: Without objection, Exhibits 1 through 7 will be entered into the record of this case.

(Whereupon, Applicant's Exhibits 1 through 7 were offered and admitted in evidence.)

Q (By Mr. Swanson) Have you any further statement to make, Mr. Watts?

A Just briefly to summarize. I believe it's evident that 160 acres can be drained by one well. This is based on available pressure data. It's based on a continuous sand development and substantiated to a degree by cumulative production to date. Really economics is a most important consideration. I doubt if this pool would have been developed on any spacing if duals with the Morrow were not possible. It's difficult to justify a 12,000-foot well for a single five-foot pay zone. We recommend the 160-acre spacing for this pool.

MR. SWANSON: This concludes our direct presentation.

CROSS EXAMINATION

BY MR. UTZ:

Q The Strawn in this area, Mr. Watts, is about 12,350 or close to that, is it not?

A Yes.

Q What is the depth of the Morrow?

A About a thousand feet deeper, 13,300.

Q You say your Federal "MA" 2 drilling well you anticipate a dual Strawn and Morrow?

A Yes.

Q And I believe you said that some of your other wells were also dualed, which were they?

A Federal "M" No. 1 and Federal "MA" No. 1. Now, the Uncle No. 1, a dual was attempted on it; however, there were some mechanical problems, it was not produced. Incidentally, that well was not drilled by Aztec. We acquired interest in the Morrow at a later date and are now producing it only as a Morrow gas well.

Q When was this Uncle No. 1 drilled in relation to the Federal "M" 1?

A Oh, in late 1965.

Q The "M" 1 was drilled when?

A It was completed in January of this year.

Q Do you have any information as to what the pressures

were in the Uncle No. 1?

A Yes. We had a drill stem test pressure in the Uncle 1. I presume you are referring to the Strawn, of course?

Q Yes.

A It was, as I recall, some 6700 pounds. Now we can't explain the difference other than possible mechanical problems in the drill stem test. In reviewing the drill stem test report we note that there is a note on it that the tool was plugging and also the surface choke was plugging, so we do have some question about that pressure.

Q You say the GOR on your "M" No. 1 is now around 1900 to 1?

A Yes.

Q This, I gather, is all solution gas?

A Well, we are assuming that the 1600 to 1 was a solution gas-oil ratio. We don't know. It would take a bottomhole sample, I presume, to really confirm that. It does seem high for a solution gas-oil ratio.

Q Do you anticipate that you actually need a 4,000 to 1 producing ratio?

A Yes, I believe so.

Q Once the well is completed?

A Comparing it to the Lusk Strawn Pool, oh, the Big Eddy Strawn, I believe the ratios in those pools climbed

considerably and in some instances reached as high, I think, as 8,000 to 1.

Q The closest Strawn Pool to this area is the Lusk?

A To the best of my knowledge that is true.

Q And do these rules that you proposed here, are they in conformance to the Lusk Strawn rules?

A Yes, very similar.

Q By "very similar", you mean the difference would be in the order of the proportional factor and what is the GOR on the Lusk Strawn?

A 4,000 to 1 limiting ratio. The spacing is the same and the well location is the same.

MR. SWANSON: The allowable I believe is different, is it not?

A Yes.

MR. UTZ: I believe you are asking for temporary 160-acre --

MR. SWANSON: Yes.

Q (By Mr. Utz) In relation to your Exhibit No. 6, is this $201,000, is that for a Strawn portion of the dual completion --

A No, that's a Strawn single completion.

Q So that your economics would be somewhat better where you could dual?

A Yes, that's true, because of the 320-acre spacing by statewide rule, any further development in the area, or at least one-half of that 320 acres would have to be from a single Strawn well.

Q Now, the Morrow in this area is gas?

A Gas.

MR. UTZ: Are there any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements in this case?

MR. HATCH: I have a telegram addressed to the Oil Conservation Commission dated May 24, 1967, "Re Case 3573, Aztec Oil and Gas application for 160-acre well spacing in South Corbin Strawn field. I fully support this request and recommend it be granted. F. W. Estle", who has been identified by the applicant as a lease owner in the area.

MR. UTZ: I presume you have no objection to this statement?

MR. SWANSON: No, sir, we are most happy to have it.

MR. UTZ: The case will be taken under advisement. We will take a ten-minute recess before we take up Case 3576.

I N D E X

EXHIBIT	MARKED	OFFERED AND ADMITTED
Applicant's 1 through 7	2	10

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 before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 14th day of June, 1967.

Ada Dearnley
NOTARY PUBLIC

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. 3523, heard by me on May 24, 1967.

Examiner
New Mexico Oil Conservation Commission