BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 5, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Texaco Inc. for special pool rules, Lea County, New Mexico. Case No. 3786

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call next Case Number 3786.

MR. HATCH: Case 3786. Application of Texaco Inc. for special pool rules, Lea County, New Mexico.

MR. KELLY: Booker Kelly of White, Gilbert, Koch and Kelly on behalf of the Applicant. I have one witness and ask that he be sworn.

(Witness sworn.)

(Whereupon, Exhibits 1 through 10 were marked for identification.)

CARL L. WHIGHAM, JR.

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, position and employer, please?

A I am Carl L. Whigham, Junior; employed by Texaco, Incorporated as Midland Division Proration Engineer, located in Midland, Texas.

Q Would you briefly state what Texaco seeks by this application?

A We seek the adoption of special pool rules to govern the development and production of reserves from the

North Paduca-Delaware Pool in Lea County, New Mexico.

Q Referring to what has been marked Exhibit No. 1, which is a plat of the general area, would you explain that to the Examiner?

A Yes. Exhibit No. 1 is a plat of the North Paduca-Delaware Pool area. The development that has taken place to date is located in Section 34 in the center of the map. The first well drilled was completed in November, that's Well No. 69, designated as an oil well in the Southwest Quarter of Section 34. Also in that quarter section is the next well drilled, Well No. 70, which is designated here as a gas well. Immediately north of Well No. 70 is a proposed location for Well No. 71. Drilling operations were actually commenced on this well about three days ago. This map also shows all of the offset operators. There are seven offset operators that have been notified of this application.

Q This Section 34 is all in the Cotton Draw Unit, is that right?

A Yes, that's correct.

Q And the outer boundary of the Cotton Draw Unit is the east edge of Section 34?

A That is correct.

Q Just for a matter of clarification, your

identification there of Township 24 South, Range 32 East actually refers to the heavy line running along the bottom of Section 34, is that right?

A Yes. The Section 34 in which development has occurred to date is in Range 32 East in Township 24 South.

Q Now, Exhibit No. 2 is a summary of your proposed rules. Would you briefly go over those for the Examiner?

A Yes. In our application for a hearing we summarize them very briefly, but we list them again here as an exhibit. The first provision we are requesting is 40-acre oil well spacing and 160-acre gas well spacing with administrative procedures for approval of non-standard proration units that may be comprised of less than 160 acres.

The second provision is that gas wells in this pool be defined as any well with a gas-oil ratio exceeding 30,000 cubic feet of gas per barrel of oil, and that an oil well be defined as any well that produces oil with a gas-oil ratio of less than 30,000. Thirdly, we are requesting a rule preventing the simultaneous designation of acreage to oil and gas wells.

Number four, we are requesting a limiting gas-oil ratio of 3,000 cubic feet of gas per barrel of oil. Number five, we request a rule to provide gas well allowables equal

to top oil well allowables times the limiting gas-oil ratio times a fraction, the numerator of which is the number of acres assigned to the well and denominator, 40.

Six, we are requesting a rule that will provide for periodic annual gas-oil ratio tests to be reported to the Commission on the standard form C-116.

Seventh and last, we are requesting six months' balancing period with balancing dates of January the 1st and July the 1st of each year.

Q Were these rules basically patterned after the Double "X" Field, which is located a little over a mile north of the proposed field?

A Yes, they were. These two fields are very similar, so we choose to pattern these rules as nearly as possible to the Double "X"-Delaware Pool.

Q Can you explain to the Examiner what differences there are in the proposed rule and the Double "X" rules?

A Yes. There are twenty-two various rules in the Double "X"-Delaware Pool, but they can be consolidated into these seven provisions that we have requested here. The major differences are two in number, the first is that the Double "X"-Delaware Pool, about one and a half to two miles to the north, has a limiting gas-oil ratio of 2,000 to one, and we're

requesting 3,000 to one. Also, the Double "X"-Delaware Pool has a rule that provides for quarterly gas-oil ratio tests, and we are recommending that annual gas-oil ratio tests be taken.

Q I notice that in your application, or in the publication for this hearing, the publication sets out the location requirements and that is not in your summary. What location requirements are you requesting?

A We would suggest and recommend that wells be located no closer than 330 feet to tract boundaries and quarter, quarter section lines and no closer than 660 feet from other wells completed in the same reservoir.

Q Now, turning to what has been marked as Exhibit No. 3, which is your structure map, would you explain that significance to the Examiner?

A Exhibit No. 3 is a structure map contoured with 50-foot contour intervals on top of the Delaware sand. The first thing it shows is the relationship between the North Paduca-Delaware Pool, located in Section 34 in the approximate center of the map and the Double "X" Pool, approximately two miles to the north, and the Paduca-Delaware Pool, approximately two miles to the south.

These three pools all produce from the Delaware

sand, which is the upper producing sand member of the Bell Canyon, which is the upper formation in the Delaware mountain group in the Guadalupean series. You will note from this structure contour map that all three of these pools are aligned on a north-south trending monocline. We believe that this North Paduca Pool is separated from the pool to the north and the one to the south primarily by permeability and porosity pinchouts.

Toward the south dry holes have been drilled between the North Paduca Pool and the Paduca-Delaware Pool. Also over in Section 35 a dry hole has been drilled in the Southwest Quarter. There have been no dry holes drilled between the Double "X" Pool to the north and the North Paduca-Delaware; however, the production or productivity of the wells is low and we believe that there is probably a porosity pinchout across there.

Q You feel there is a complete separation between the Double "X" Field and the North Paduca and the Paduca Field to the south?

A Yes. We feel these pools are quite similar, however, we do believe they are separate reservoirs. With only two wells drilled and producing to date in the North Paduca-Delaware Pool, we cannot accurately delineate the limits of

this reservoir. However, we do feel that this reservoir will be similar to the many other Delaware reservoirs that have been developed in New Mexico, most of which will have a limit on the down-structure side due to oil-water contact.

Now, our log calculations and the production from the wells indicate that we are, in Well No. 69, at or near the oil-water contact.

MR. NUTTER: What about the well in Section 35? Was it water-productive?

THE WITNESS: I don't have the details on the production, but it undoubtedly was because it encountered the Delaware sand, as shown here on the log at a subsea depth of 1296, and all of the wells shown on this map will produce water if they're completed below or at that depth.

Q (By Mr. Kelly) Do you know what the water-oil contact up here in the Double "X" is?

A I believe that it is at approximately 1260 feet and also down in the Paduca-Delaware.

MR. NUTTER: About 1260?

THE WITNESS: Yes.

MR. NUTTER: So you anticipate 1260 here?

THE WITNESS: Actually we have estimated that the oil-water contact in the Paduca-Delaware may be lower. We

think it may be at 1290 feet in this pool.

MR. NUTTER: But you went west for your first location after your discovery, anyway?

THE WITNESS: We went updip.

MR. NUTTER: And got gas?

THE WITNESS: Yes, and some oil. Now updip we think the limits of this pool will be determined by porosity and permeability pinchouts that are caused by the increase in shaliness as you move updip in the Delaware sands. This will be confirmed, of course, by our later development.

Q (By Mr. Kelly) You have a summary of the reservoir data, which is Exhibit No. 4. Would you go through that for the Examiner?

A Yes. This shows, again, that the producing reservoir in this North Paduca-Delaware Pool is similar to other Delaware reservoirs. It has a high porosity and permeability of 26 percent and 23 millidarcies, respectively. The water saturation is about 47 percent. Here is where we have listed an estimated water-oil contact at a minus 1290. We estimate a gas-oil contact at 1240 subsea depth. This gives a gross interval of 50 feet, however, we estimate that the net effective pay would be only about 13 feet.

The gravity is 40.4 A.P.I. for the oil and 0.826

for the gas. The pressure is about 1713 P.S.I. at the present time in the reservoir and we list here that in our opinion this is a typical stratigraphic trap and the producing mechanism is solution gas drive.

Q What acreage is going to be dedicated or is dedicated to the two wells?

A Well, at the present time the pool is operating under statewide regulations, so the Northeast Quarter of the Southwest Quarter would be dedicated to Well No. 69 and the Northwest Quarter of the Southwest Quarter would be dedicated to Well No. 70.

Upon approval of these rules the acreage for Well No. 69 will remain the same, however, the remaining 120 acres in the Southwest Quarter of Section 34 would be dedicated to Well No. 70.

Q Going on to Exhibit No. 5, which is your well data for your two wells, would you briefly go over that for the Examiner?

A Yes. This shows the limited development in this pool to date, with Well No. 69 being completed last November and Well No. 70 being completed last March. Both wells are completed at approximately the same interval with regard to depth. As shown by a later exhibit, both wells are completed

in the same geological interval. We list on this exhibit the elevation of both wells. Applying this number to the completion interval we will find that Well No. 70 is completed exactly 20 feet higher structurally than Well No. 69. Well No. 69 is presently pumping at a rate of 11 barrels of oil and 17 barrels of water daily with a gas-oil ratio of 2970, whereas Well No. 70, the gas well, is flowing 27 barrels of oil, 30 barrels of water, with a gas-oil ratio of 27,630.

Q Now, Exhibits 6 and 7 are the logs of the two wells; do you have anything you want to add on that?

A Actually the information that is shown on the logs is also contained here in a tabular form on this Exhibit No. 5.

Q Go on to your completion and the test history of the two wells, which we have marked as Exhibits 8 and 9.

A Exhibits 8 and 9 show, firstly, the difficulty encountered in completing these wells. The wells require a considerable amount of stimulation before they will produce. These exhibits also show that even after this type of treatment, the productivity is not high at all. It also indicates the questionable economics. We think that with the rules that have been recommended, that this type of production could be economical.

Well No. 69 was acidized and then sand fracked, then after several days of swabbing all of the load fluid was

recovered and new oil was present in the well bore. At that time a pump was installed and the first test taken November 23, 1967 showed 20 barrels of new oil and 46 barrels of water produced during a 24-hour period with a gas-oil ratio of 2,400. Then over the next two or three months the production had declined to 11 barrels of oil and 17 barrels of water with a gas-oil ratio of 2,970. That's the same test that was reported previously on our exhibit entitled "Well Data Summary".

Then the next exhibit, Exhibit No. 9 gives the same information for Well No. 70. This well was completed in a very similar manner; however, as shown by these tests, it produces about ten or eleven barrels of oil with about 40 barrels of water, with a gas-oil ratio ranging anywhere from 27,630 up to in excess of 100,000 cubic feet of gas per barrel of oil.

Q Now, I take it you don't feel that any of the present wells or any of the future wells in this pool will probably be top allowable oil wells?

A It is not indicated by the production and test history of these two wells.

Q And you previously testified this is a solution gas drive?

A Yes.

Q Do you think that having a gas-oil ratio of 3,000 to one would have any effect on ultimate recovery in this reservoir?

A It should have no effect at all on ultimate recovery. The rate of withdrawals from this solution type reservoir should have no effect on any amount of oil that is ultimately recovered from the reservoir.

Q Do you have an opinion as to the effect that a 2,000 to one GOR would have on further development and, therefore, ultimate recovery in this pool?

A Well, with the standard 2,000 limiting gas-oil ratio, these wells would be penalized excessively, and unnecessarily, it would accomplish no useful purpose and also it would cause an operator to be reluctant to drill additional wells in this area if he thought that his wells would be unduly and unnecessarily penalized with regard to allowable.

Q Do you think that a 3,000 to one GOR would have any adverse effect on anyone's correlative rights in the area?

A No, it should not.

Q I take it that in your opinion, based on the definition of a gas well, that you would propose that Well No. 70 would probably become a gas well?

A Yes. The most recent test shows that it has a gas-oil ratio of 27,000 some odd cubic feet per barrel of oil. We haven't mentioned yet, but this well has only produced about once a week. We do not have it connected to a gas outlet at the present time, so for conservation purposes we only produce it a minimum amount and we feel that this gas-oil ratio will go higher if we produce it continuously.

Along these same lines I can advise that there are two gas lines in the very immediate area of this development and we feel that as soon as we find out what rules we'll be operating under, and also complete Well No. 70, correction, Well No. 71, we will have a better idea, much better idea of how much gas will be available and we anticipate no difficulty whatsoever in negotiating a contract to sell all the gas that is purchased.

Q You have an Exhibit No. 10 which is your total performance, do you have anything you want to add on that?

A Yes. I would like to say that Exhibit No. 10 represents the production of oil, water and gas on a monthly basis since development. However, since Well No. 69 and Well 70 are somewhat different, these curves represent an average of what you might call two extremes, so they're not very indicative of individual well performance.

We have already discussed the tests that have been made on these two wells and their producing capabilities, and that information would be much more valid on an individual well basis than anything that could be determined from Exhibit No. 10. So this exhibit serves primarily to show how much oil, water and gas has been produced from the North Paduca-Delaware Pool since it was discovered last November.

Q I assume, based on the information you now have, that you feel that an oil well could drain 40 acres and a gas well 160 acres?

A Yes, we do. And, of course, this spacing is statewide spacing, so we think that the future development can proceed under that type of regulation.

Q In your opinion, would the granting of this application prevent waste and promote the efficient production of hydrocarbons in the proposed pool?

A Yes.

Q And protect correlative rights of all operators?

A Yes, we think so.

Q Were Exhibits 1 through 10 prepared by you or under your supervision?

A Yes, they were.

MR. KELLY: I move the introduction of Texaco's

Exhibits 1 through 10.

MR. NUTTER: Texaco's Exhibits 1 through 10 will be admitted in evidence.

(Whereupon, Exhibits 1 through 10 were offered and admitted in evidence.)

MR. KELLY: That's all I have, Mr. Examiner, on direct.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Whigham, you had a very brief perforated interval in both of these wells, the No. 69 is perforated from 4795 to 4800, which is only five feet. The other well, which is the gas well, is perforated from 4764 to 74, so it's only perforated ten feet there. Is there any possibility that you have got a gas-oil contact and that that ten-foot interval in the No. 70 has cut that gas-oil contact?

A There is a possibility that the perforations in Well No. 70 could be very near to the gas-oil contact.

Q Because, of course, you only have ten feet perforated but you have twice as many feet of perforations as you do in the other well.

A Yes. Yes, that's possible. Let me refer back to our well data exhibit, Exhibit No. 5. Well No. 70 would have

a completion interval based upon sea level of 1258 to 1268. The ten feet you referred to, and then we have estimated our gas-oil contact at a minus 1240, so our estimate at this time is that the gas-oil contact is some 18 feet above the top of the perforations in Well No. 70.

Q How do you account for the high gas-oil ratio here, then?

A Well, there is undoubtedly a transition zone and we--

Q You are in the transitional zone?

A Actually I would imagine that if we were completed another 18 feet up we might get maybe, well, close to dry gas.

Q This is what's concerning me, Mr. Whigham. You are asking for a 3,000 to one GOR here and if you go up here, go on up-structure and get well above the gas-oil contact and get into a dry gas zone and start taking gas out at the current rate of 58 barrels of oil per day top allowable times 3,000 times 30 days a month, you will be taking out five million cubic feet of gas a day. I'm wondering if you are going to complete the gas cap that might be here and cause the migration of oil up-sand and wet those gas sands, thereby losing oil.

A If future development indicates that to be the case, then there would be a very small oil rim lying on structure

trending north and south and this might well, then, essentially be a gas reservoir.

Q Do you know up here in the Double "X" Field this Tenneco gas well which is there in Section 22, is it a dry gas well or is it a well that makes oil and gas, or what?

A Well, I'm not familiar with this Double "X" Pool. However, with the several oil wells that are indicated east of that well, it would appear to me that Well No. 2, the gas well, would probably be completed in the gas cap.

Q Of course, it's a good half mile from the nearest oil well to the gas well. Here on your location you went a quarter of a mile away and change from an oil well to gas well.

A Yes.

Q It may be that you have some dry gas if you keep on going west up-structure before you get to this porosity and permeability pinchout?

A That may be true. It could certainly happen that Well No. 71 being on the strike with Well No. 70 may not, well, we don't know what that will show, it should be a well similar to Well No. 70, but any future development will probably be westward and possibly at that time we will have a better idea of what type of reservoir this may be.

Q Incidentally, for the sake of the record, that five

million that I was talking about awhile ago would be for 40 acres. If you had 160 acres for a gas well you would be producing over twenty-one million?

A Yes.

Q Is there any gas cap that you know of in the Paduca-Delaware sand down in your pool to the south? The exhibit doesn't show any gas wells in this portion of the pool, anyway.

A That's right. Let me refer to another map that I have with me that shows in more detail that Paduca-Delaware Pool. I don't believe there are any gas wells in the Paduca-Delaware.

No, I have another map here that shows the entire Paduca-Delaware Pool and there are no gas wells designated on this particular map. This map has been presented to the Commission at other Texaco hearings concerning the Cotton Draw Unit area, so you have this map on file. It indicates no gas wells in this immediate area.

Q No gas cap to the west in the pool in that case?

A No.

Q Where is the Battle Axe-Delaware Pool, do you know?

A I looked that up a few days ago. I don't remember exactly where it was. It was removed from this area, so I

didn't investigate it.

Q It's a similar type of pool to this, however, isn't it?

A I don't know. I don't know exactly what type it is. It was removed from this area so I didn't investigate it.

Q How long do you think it will be before the No. 71 is completed, Mr. Whigham?

A Probably one month from now we should have a test on it.

Q And you didn't have any other locations proposed right at this present time?

A No, we don't. However, Mr. Beard, who holds half interest in the half section immediately west of this area, has indicated an interest in the development in this area and it's quite possible that a well will be drilled in the near future in the East Half of Section 33.

Q He'd probably wait the outcome of No. 71 before he drilled that?

A Yes. Texaco has one-fourth interest in the East Half of Section 33. I think all of this is shown on Exhibit No. 1. Texaco has a fourth, Paul Lippett has a fourth and Beard Oil Company has one-half interest, and all three of these parties have expressed interest in further

development.

Q We were talking about Exhibit 5 awhile ago, we got these subsea elevations of these perforated intervals on the No. 7 well, what would that be for the No. 69? Have you got those figured out?

A Yes. The completion interval would be from 1278 to 1283.

Q That's where you had your twenty feet difference then, between 58 and 70?

A Yes.

MR. NUTTER: Are there any other questions of Mr. Whigham?

MR. KELLY: Just one or two questions.

REDIRECT EXAMINATION

BY MR. KELLY:

Q The proposed rules are proposed as temporary or permanent rules?

A Well, we have proposed them as permanent rules. Needless to say, Texaco will be, and other operators will be obtaining as much reservoir information as possible in order to more accurately delineate the reservoir and define its producing characteristics. We would, of course, have no objection at all to these rules being promulgated on a

temporary basis for, say, a twelve-month period. We expect to have additional information, certainly, by that time.

Q If the Commission wanted to continue jurisdiction of this case, say, to find the effect that higher GOR ratio would have, you would have no objection?

A Not at all.

MR. NUTTER: Along those same lines, in the event that the Commission approves these pool rules you have proposed here while this pool is being investigated on a temporary basis, wouldn't it be advisable for the Commission to schedule the GOR tests more frequent than once a year in order to detect migration of oil up-structure?

THE WITNESS: Yes. We have considered that, Mr. Examiner, and there would be no objection to submitting these tests more frequently.

MR. NUTTER: At least during the period of development and fluctuation in the pool?

THE WITNESS: Absolutely. We will have the gas-oil ratio available, if you would like to see them more frequently, and I believe probably you would, we would have no objection at all to quarterly or semi-annually gas-oil ratio tests.

MR. NUTTER: You further understand that in the event the Commission enters the order and approves the

designation certain wells as gas wells and certain wells as oil wells, that it would be prohibited to produce the gas and flare the gas until such a time as they had been connected?

THE WITNESS: Yes, we understand that. We feel, as I mentioned previously, that we can get suitable contract and can sell all the gas that will be produced.

MR. NUTTER: This would not only be gas well gas, but casinghead gas as well?

THE WITNESS: Yes.

MR. NUTTER: Very good. Any further questions of Mr. Whigham? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Kelly?

MR. KELLY: No.

MR. NUTTER: Does anyone have anything further to offer in Case 3786? We will take the case under advisement, and the hearing is adjourned.

I N D E X

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 9th day of July, 1968.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3786, heard by me on 7/5, 1968.

, Examiner
New Mexico Oil Conservation Commission