BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
State Land Office Bldg.
Santa Fe, New Mexico
September 2, 1970

EXAMINER HEARING

IN THE MATTER OF:	
Application of Phillips Petroleum Company for creation of a new oil pool, special pool rules therefor, and redesignation of the vertical limits of the Ranger Lake-Pennsylvanian Pool, Lea County, New Mexico.	Case No. 4421

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

DEARNLEY-MEIER REPORTING SERVICE

MR. HATCH: Application of Phillips Petroleum Company for creation of a new oil pool, special pool rules therefor, and redesignation of the vertical limits of the Ranger Lake-Pennsylvanian Pool, Lea County, New Mexico. Applicant, in the above styled cause, seeks the creation of a new pool for the production of oil from the Bough section of the Pennsylvanian formation for its Phillips West Ranger Lake Unit Well No. 1 located in Unit C of Section 26, Township 12 South, Range 34 East, Lea County, New Mexico, and for the promulgation of special rules therefor including a provision for 80-acre spacing and proration units, with verticle limits of said pool to be the interval from sub-sea datum -5671 feet to -6016 feet as found in said Well No. 1. Applicant further seeks the contraction of the vertical limits of the Ranger Lake-Pennsylvanian Pool to that interval from sub-sea datum -6080 feet to -6230 feet as found in its West Ranger Lake Unit Tract 2 Well No. 1 located in Unit P of Section 23, said township and range.

MR. KELLAHIN: Commissioner, please, Jason Kellahin of Kellahin and Fox appearing for the applicant. I have one witness I'd like to have sworn.

(Witness was sworn)

R. J. STRINGER,

the witness, having been first duly sworn upon his oath, according to law, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name?

A R. J. Stringer.

Q By whom are you employed and in what position, Mr. Stringer?

A Phillips Petroleum as a Reservoir Engineer.

Q Where are you located?

A Odessa, Texas.

Q Have you ever testified before the Oil Conservation Commission?

A No, Sir.

Q One of its Examiners?

A No, Sir.

Q For the benefit of the Examiner, would you briefly outline your education and experience as an engineer?

A I graduated from the University of Oklahoma, 1951 with a Bachelor of Science Degree in geological engineering and I have worked for Phillips Petroleum since then as an exploration geologist and the last five years as a reservoir engineer.

Q In connection with your work as reservoir engineer, does the area involved in this application come under your jurisdiction?

A Yes, Sir.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. UTZ: Yes. They are.

Q Mr. Stringer, are you familiar with the application of Phillips Petroleum Company in Case 4421?

A Yes, Sir.

Q Briefly what does Phillips propose in this application?

A We propose to establish that we have separate reservoirs in the Pennsylvanian -- the presently classified Ranger Lake Pennsylvanian Pool.

Q What you are saying there is there are two separate common sources of supply underlying the present pool limits, is that right?

A Yes.

Q Now, referring to what has been marked as Exhibit No. 1, would you identify that exhibit, please?

A Exhibit 1 is an eight and a half by eleven plat covering the Ranger Lake Pool area in Township 12 South, Range 34 East, of Lea County, New Mexico and it is contoured on top of the Bough "C" member of the Pennsylvanian but contour interval of ten feet. It shows all of the wells presently classified in the Ranger Lake Pool. The purple or lavendar color coded wells are the Devonian formation mostly in the south part of the field. There are three in

the center that have purple slashes through them. These are depleted Devonian producers. The dark blue, represents the unitized interval of the Ranger Lake secondary recovery pool -- unit, I should say -- and the red color represents the Bough production which is above the unitized interval. The red outline in this plat designates the exploratory unit which was formed in 1956 for the building of the discovery Pennsylvanian well which is now the Ranger Lake Unit No. 2 water injection well 1 in Unit P, Section 23. The blue dashed outline is the outline of the secondary recovery Ranger Lake Unit. The apple green line AB running from north to south is a line of cross section which will be Exhibit No. 2. The second yellow area referred to here is the West Ranger Lake Unit Well No. 1 in Unit C, Section 26, what I will refer to as the subject well.

Q Now, as I understand it, the dashed line outlines the waterflood project in the Ranger Lake area, is that correct?

A Yes, Sir.

Q And when you refer to the unitized formation as shown by the blue and the wells outlined in blue, is that the formation that is unitized for water injection?

A Yes, Sir.

Q And your Bough "C" zone as shown by the wells outlined in red is not unitized and does not participate in the

waterflood project, is that correct?

A Correct.

Q Referring to what has been marked as Exhibit No. 2, would you identify that exhibit, please?

A Exhibit No. 2 is a north-south cross section A to B previously referred to; the north being on the left, the south on the right. The well symbols in colors on top of the cross section correspond with the colors and symbols on the map and the red color on the logs represents the Bough completion intervals and the blue colors on the logs represent the unitized Ranger Lake Unit intervals.

Q What is the separation between those two zones?

A The vertical scale here is one inch to 100 feet and the separation in the two zones from the base of the productive interval of the Bough to the top of the productive interval, the unitized interval is approximately 200 feet.

Q In connection with your waterflood project, you identify the unitized formation by reference to a particular well, do you not?

A Yes.

Q Which one is that?

A That is the previously referred to well in Unit P, Section 23.

Q That well does not appear on your cross-section?

A No, Sir. The correlative interval is marked on the

seventh well from the left cross-section.

Q That is the correlative interval to the one in your designated No. 2 well?

A Correct.

Q Now, the Bough "C" zone that you are referring to is shown on the exhibit, is it not -- the well to which you make reference?

A Yes. The Bough "C" top of the Bough "C" is one of the correlation points marked on the cross-section.

Q And do you identify that in any particular well or do you have it marked inall of them?

A Yes. The same well we just referred to is identified as the area colored --

Q That is the West Ranger Unit?

A Yes, in Section 26.

Q Does that complete your testimony with Exhibit No. 2, Mr. Stringer?

A Yes.

Q Referring to what has been marked Exhibit No. 3, would you identify that exhibit, please?

A To substantiate the separation, Exhibit No. 3 is the production history of the Ranger Lake Unit area. It should be noted the blue color represents the water production; the red color represents the oil production. I'd like to point out here that in the fluids and it will be noted in the early

life of this producing zone large volumes of water were produced.

Q That water production, could that have been in any way related to your water injection in the Ranger Lake Unit?

A No, Sir. I don't believe it is. It is well over a mile -- correct that -- it is in a separate area, I should say, from the flood.

Q And in your opinion, is it a separate formation?

A Yes, a separate horizon.

Q None of the water injected would ever be injected into what you have identified as the Bough "C", would it?

A No, Sir.

Q There were no perforations in your injection wells in that zone, were there?

A No.

Q Does this indicate to you that these are separate reservoirs?

A Yes. It indicates to me that this is -- the Bough is a water dry reservoir whereas the unitized interval is a solution gas reservoir.

Q Now, referring to what has been marked as Exhibit 5 and Exhibit 6, would you identify those exhibits, please?

A Exhibit 5 and 6 are water analysis of produced water taken the same day from the two producing horizons. Exhibit 5 represents water produced from the well in Unit D,

Section 26 and the unit or Exhibit 6 represents produced water from the well in Unit C, Section 26.

MR. UTZ: You say Unit D, Section 26?

MR. KELLAHIN: The No. 10 well.

MR. UTZ: O. K.

THE WITNESS: It will be noted in the chloride content of the water analysis the Bough formation chloride content was 12,500 -- I beg your pardon -- fifty thousand, whereas the unitized interval water production chloride content is presently twelve thousand five hundred. We interpret this as the unitized interval having been diluted with the fresh water -- relatively fresh water injected. The original chloride content in the unitized interval taken on a well in November of 1959 was sixty six thousand parts per million.

MR. UTZ: That was taken where?

THE WITNESS: That was taken in well Unit J, Section 27.

Q That was prior to the water injection program in the unitized area?

A Right.

Q So that would be the natural condition of the water?

A Yes.

Q Does the difference in the chloride as between fifty thousand and sixty six thousand parts per million indicate a separate reservoir?

A Not necessarily, but --

Q Does the fact that the chloride in the unitized area is now down to twelve thousand five hundred indicate anything?

A Yes. This, as I pointed out, indicates that it has been diluted.

Q And that it had no effect on the Bough "C"?

A No, Sir.

Q Referring to what has been marked Exhibit No. 7, would you identify that exhibit?

A One other thing, before I go on. I might point out that we have taken pressures which to us indicate separate reservoirs also. The initial pressure in the unitized interval in November of 1965 was thirty five hundred seventy per square inch. In 1963, just prior to the start of water injection, the bottom hole pressure in this unitized interval was five hundred eighty seven -- approximately a three thousand pound drop. In August, 1970, bottom hole pressure in the unitized interval is forty nine hundred eighty five pounds per square inch.

MR. UTZ: In the unitized interval -- it is forty nine eighty five now?

THE WITNESS: Yes.

MR. UTZ: Did you give a figure for the Bough "C"?

THE WITNESS: The Bough "C" is presently three thousand seventy one. Presently over nineteen hundred pounds difference in the two reservoirs.

Q Does that indicate that they are separate sources of supply?

A Yes, Sir.

Q Now, would you identify Exhibit No. 7, please?

A Exhibit 7 is a telegram from our partners in the exploratory unit and in this subject well, Texas Pacific Oil Company, supporting us in this application.

Q Now, Mr. Stringer, in this application Phillips proposes the designation of two separate pools for oil production. How would these two pools get identified or separated for purposes of Commission Order?

A In the application, as in the application, we ask or suggest, I should say, designating the interval from sub-sea datum -5671 to -6016 as found in the Phillips West Ranger Lake Unit Well No. 1 and in Unit C, Section 26 and contraction of the vertical limits of Ranger Lake-Penn Pool to that unitized interval designated by the sub-sea datum of -6080 to a -6230 in the Ranger Lake Unit Tract 2 Well 1 in Unit P, Section 23, the same township and range.

Q Are those intervals intervals that can be correlated across the entire pool?

A Yes, Sir.

Q As to the horizonal limits of the pool, do you have any suggestions?

A Either the presently area for the Ranger Lake Pool or whatever the Commission would prefer.

Q Or it could be contracted insofar as the Bough "C" as to the area that is producing?

A Yes.

Q There would be no objection to that, would there?

A No.

Q In no way would this contraction of the Ranger Lake Pennsylvanian Pool affect the interests owned in the water-flood project, would it?

A No, Sir.

Q Or would the correlative rights of any other operator be affected?

A No, Sir.

Q Do you know of any wells in the area that are completed in both intervals?

A No. There are none.

Q Were Exhibits 1 through 6 prepared by you or under your supervision?

A Yes.

Q And Exhibit 7 is a copy of a telegram received by your company?

A Yes.

MR. KELLAHIN: At this time, I'd like to offer in evidence Exhibits 1 through 7, inclusive.

MR. UTZ: Exhibits 1 through 7 will be entered in the record in this case.

Q Do you have anything to add, Mr. Stringer?

A The only thing I would like to add was that after making the application I checked and discovered that this is similar to what was done in the North Bagley Pennsylvanian Pool where in September of 1957, under Order R-1059, the North Bagley Pennsylvanian Pool was established and October of 1962, under Order R-2313, the North Bagley Pool -- North Bagley Penn Pool was abolished and the same order created the North Bagley Upper Penn and the North Bagley Lower Penn.

Q Is this a similar situation?

A Yes, Sir.

MR. KELLAHIN: That completes our presentation, Mr. Utz.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Stringer, I seem to have lost you on the vertical limits here. Now, the vertical limits now in the Ranger Lake is just the Pennsylvanian part?

A Yes.

Q And you proposed to contract those to what sub-sea datums, now?

A The Bough interval would be sub-sea -5671 to -6016 as found in well in Unit C of Section 26. The Ranger Lake Penn would be identified as sub-sea -6080 to -6230 in well in Unit P of Section 23. Now, I used that well because that is

the well that is referred to in the unit agreement as identifying unitized interval but it is correlative with this interval that you are looking at on the cross-section.

Q That well is the --

A That is the presently named Tract 2 Water Injection Well No. 1, Ranger Lake Unit.

Q That is when I lost you. That well isn't shown on here, is it?

A No, Sir. I have a copy of the log, if you would like to have it.

Q I don't think so. I will let our geologist down in Hobbs take a look at it if he wants to. So from the top of the Bough "C" -- correction, from the top of the Ranger Lake up to the base of your proposed Bough "C" interval is what -- about sixty feet?

A Yes.

Q It is getting pretty close, isn't it -- you consider that entire interval as Bough "C"?

A No. We consider it Bough -- maybe Bough.

Q The Bough "C" would be something smaller than that?

A Yes, Sir.

Q I don't think -- the only thing that entered my mind at the moment is fifty or sixty feet is not much separation between the two pools. What is the bottom of the sub-sea datum of the -- the bottom of the perfs in Ranger Lake Unit

No. 1 well?

A That is 5821.

Q 5821?

A Yes, Sir.

Q Do you think that you need all that interval below there?

A Not necessarily, but if we don't, the object was to bring the two together -- not leave any separation and in my opinion, all the unitized interval is developed in the Unit.

Q It is your testimony then, that that fifty or sixty feet is enough to affect a separation vertically?

A Yes, Sir. You will note several shale -- continuous shale stringers in this two hundred feet from the base of the productive interval in the Bough "C" to the top of the productive interval in the unitized interval.

Q And your No. 10 well in Section 26, you feel that this produced water over here in the No. 10 well is injection water from the No. 2 water injection well. Do you have more injection wells than that one?

A It could be from either or both.

Q Are those the only two injection wells in the project?

A No. The injection wells are all designated with "W" before their number and a straight line through the center.

Q I see. The fact that this water is less salty, could

be that the use is just pushing a blanket of salt water ahead of the fresh water -- couldn't it? In other words, the water doesn't all become fresh at the same time in a reservoir, does it -- if you got salty water in the reservoir, your fresh water will push a blanket of salt water ahead of it?

A Yes, Sir.

Q You don't think that could be the reason for this water being salty?

A Well, part of it is the formation water. It is a combination of formation and the injection. We are injecting produced water also.

Q Of course, you have another argument that your pressures at this time are substantially different?

A Yes, Sir.

MR. UTZ: Any other questions of the witness?

MR. HATCH: What acreage would you propose to dedicate to the well, the subject well?

THE WITNESS: We propose following the same designation as in the Ranger Lake Penn which would be 80-acre spacing and the normal locations are the Northwest, Southeast Quarters of the sections. This is a non-standard location. It would have to be that we'd have to accept that. We have proposed an 80-acre north-south.

MR. HATCH: North-south 80-acres?

THE WITNESS: Yes.

MR. UTZ: You are proposing the same rules as the present rules in Ranger Lake?

THE WITNESS: Yes.

MR. UTZ: That is 80-acre spacing?

THE WITNESS: Yes.

MR. UTZ: Do you happen to have an Order number handy? If you don't, it is no problem. I just thought maybe you had it.

THE WITNESS: I can dig it out here. That is R-1418 C.

MR. UTZ: What?

THE WITNESS: 1418 C.

MR. UTZ: Thank you.

Any other questions of the witness?

The witness may be excused.

Statements in this case?

The case will be taken under advisement.

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, Peter A. Lumia, Court Reporter, 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.

Peter A. Lumia

Peter A. Lumia, C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4421 heard by me on 9-2-70.

New Mexico Oil Conservation Commission

I N D E X