BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 24, 1963

EXAMINER HEARING

IN THE MATTER OF:

Application of Phillips Petroleum Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg-San Andres formations, Maljamar Pool, Lea County, New Mexico, through one well in Unit J, Section 2, Township 17 South, Range 32 East. CASE 2799

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 2799.

MR. DURRETT: Application of Phillips Petroleum Company for a waterflood project, Lea County, New Mexico.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, Santa Fe, representing the Applicant. We have one witness I would like to have sworn, please.

(Witness sworn.)

DON L. CZIRR

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Don Czirr. C-z-i-r-r is the last name.

Q Mr. Czirr, have you testified before the Oil Conservation Commission and made your qualifications as an engineer a matter of record?

A Yes, sir.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q (By Mr. Kellahin) Are you familiar with the application of Phillips Petroleum Company in Case 2799?

A Yes, sir, I am.

(Whereupon, Applicant's Exhibit No. A, 1 through 8, marked for identification.)

Q Will you state briefly what Phillips proposes in this application?

A Phillips proposes to operate their Kennedy State lease as a waterflood project under the Commission's Rule 701; to also inject water into the No. 1 Well; and to request the transfer of allowable privileges as provided under the waterflood Rule 701.

Q In other words, you are proposing to operate strictly under the provisions of Rule 701, is that correct?

A That is correct.

Q Referring to what has been marked as Exhibit No. 1, will you discuss the information shown on that exhibit, please?

A Exhibit No. 1 is a map of a portion of the Maljamar Pool area of Lea County, New Mexico, and shows the Phillips Kennedy State lease in green. The arrow shows the Phillips Kennedy State Well No. 1 which we propose to convert to water injection. The Exhibit 1 was submitted with the application and shows all the wells within a radius of two miles of the proposed injection well. It also shows that the Phillips Kennedy State lease is on the extreme north and on the edge of the Maljamar Grayburg-San Andres Oil Field.

Q Are all the wells within this two-mile radius producing from the Grayburg-San Andres?

A Yes, sir, with the exception as noted, the Pan American North Maljamar Deep Unit Well No. 1.

Q Would you refer to Exhibit No. 2 in Exhibit A and discuss the information shown on that exhibit?

A Exhibit No. 2 is a larger scale map also of a portion of the Maljamar Pool in and around the Phillips Kennedy State lease. Again, the 80-acre Phillips Kennedy State lease is designated as green, and the proposed water input well, that is the No. 1 Well, is designated by the arrow.

In addition, by color codes, the other waterflood operations in this immediate vicinity are designated. Immediately south is the Boller-Nichols waterflood area, and it can be seen from the triangles which represent water input wells that the conversion of the No. 1 Phillips Kennedy State Well to water

input will complete an injection pattern that is now in existence on the Boller-Nichols project, and has been approved by the Commission. This completion of this pattern will increase the efficiency of the waterflood operations in this area, and in my judgment will result in increased recovery.

Q Will the interest of all the operators be protected by this injection as proposed by Phillips?

A Yes, sir, it will. There are no immediately offset San Andres wells to the north. This would benefit the offset operator, the Boller-Nichols flood, in that it completes their pattern as well as increases the water injection in the vicinity of the Phillips Kennedy State lease.

Q Now referring to Exhibit No. 3 to Exhibit A, will you discuss the information shown on that exhibit, please?

A Exhibit No. 3 is a schematic sketch of the oil producing rates and water injection rates for wells in the vicinity of the Phillips Kennedy State lease. It shows the two wells on the Phillips Kennedy State lease and the injection and producing wells on the Boller-Nichols waterflood project. It has been included to show that the waterflood operations in this area are successful, that they do result in a stimulation of producing rates and an increase in recovery.

It also shows that the conversion of the Phillips Kennedy State No. 1 Well as proposed will improve the pattern efficiency of the waterflood in this area.

Q This is the same basic information that was presented to the Commission in a prior hearing, was it not?

A That's correct. It has been up-dated for the purpose of this hearing is the only change. One other thing, it will be noted that our No. 2 Well, which will be the producing well under this proposal, is receiving stimulation from waterflood operations in this area at the moment, so there is no question but that this 80-acre tract can be successfully waterflooded.

Q That was the well for which Phillips had received an increase in allowable because of stimulation, is that right?

A That is correct. Immediately north of the Kennedy State lease, the permeability is gradually reduced and,based on our experience,further extension of the field in that direction is not commercially possible.

At the same time fluid is allowed to migrate, so we had previously asked for a capacity allowable for what is now designated as our Phillips Kennedy State No. 2 for the sole purpose of preventing the migration of fluid from the waterflood area into the border area and non-commercial area of the Maljamar Pool. Now the application we are making today is in response partially to suggestions by the Commission to see if there wasn't some way that we could unitize these tracts, or to convert certain wells to improve the efficiency;and the only means we have found, after considerable exploring of the subject, has been to acquire the 40-acre tract designated as the Phillips Kennedy

State No. 1 now. It was formerly the Kennedy State, and we think that that does do what is necessary in the area to reduce this migration.

It will allow us to produce the 42 barrels currently assigned to the Phillips Kennedy State No. 2, plus the 42-barrel waterflood credit from the injection well; and we think this additional allowable will aid in the prevention of migration of fluid out of this area into this border and non-commercial portion of the field. So in that regard, we think that it will be certainly in the interest of conservation.

Q Referring to what has been marked as Exhibit No. 4 in Exhibit A, will you identify that as an exhibit and discuss the information pertaining to it?

A Exhibit No. 4, Cross Section A-A^{1}, is a north-south cross section that shows the correlation of the Grayburg-San Andres producing zone in these wells, and shows that the producing well is the well designated here under its old name, Mexico "A" No. 2, now Kennedy State Well No. 2, is identical with the wells being operated on the Boller-Nichols waterflood project to the south. It is one common source of supply and in communication, and should respond to waterflood operations just like it has in fact done.

Q Referring to Exhibit 5 of Exhibit A, will you discuss that?

A Exhibit 5 is an east-west cross section submitted for

the same reason, designated as B-B[1]. It was submitted to show the correlation between the now Phillips Kennedy State Well No. 2, which will be the producing well, and the Phillips Kennedy State Well No. 1, which is the proposed injection well. We believe the correlation, just as in the north-south cross section, is good through here. These zones are common to both wells and should respond to waterflooding.

Q Now referring to Exhibit 6 of Exhibit A, would you identify that exhibit and discuss the information shown on it?

A This exhibit is a decline curve of the Phillips Kennedy State lease and shows that the primary rate of production has declined to near the economic limit, and that waterflooding is required to maintain income from this property over an extended length of time, and also shows that waterflood response has in fact been received. This increase in production is a result of the production from the Phillips Kennedy State Well No. 2, and in the absence of the increased allowable which we obtained, or the approval of extending this waterflood project to where we could have a higher allowable for No. 2 Well, this oil would be expected to migrate out of the commercial limits of the field.

Q At the time what was then Mexico Well No. 2, now the Kennedy State No. 2, received its response, had the Kennedy well received a response, the one that you propose to now use for injection?

A No, sir, it has not received any response whatsoever.

Q Now referring to Exhibit 7 of Exhibit A, would you discuss the information shown on that exhibit?

A Exhibit No. 7 is the Phillips Kennedy State lease injection well data form and shows the well location, the fact that the classification is in the Maljamar Grayburg-San Andres Field, and shows the injection interval as being through the particular pay that is 4,000 foot to 4,420 foot; injection will be into open hole. We tentatively plan to use Ogalala water as our injection water, and it will be purchased water as opposed to water developed on our lease.

Q What is your source?

A It will be from the adjacent operator, Waterflood Associates are operating the Boller-Nichols project. We are in the process of negotiating to obtain water from that operator to inject into the Phillips Kennedy State No. 1.

Also this exhibit shows the casing programs. It will be noted the 9-5/8ths inch casing was set at 1200 foot and cemented with 600 sacks of cement. This is well through any fresh water strata, and the 600 sacks of cement are more than the calculated requirements to circulate cement.

This well was not drilled by Phillips, so I couldn't testify to the fact that it was circulated, but a 9-5/8ths 12-inch hole annulus would be about 3-1/2 linear foot per sack of cement or some 2,142 foot of fill; taking the larger size hole of 12-3/4 inch and the annulus between it and 9-5/8 inch casing would be

1572 linear foot of fill, so under any reasonable hole diameter estimate there, the 9-5/8ths inch is in fact cemented, it would be anticipated to be cemented back to the surface and all strata of fresh water are protected.

It also shows the fact that we have production casing string set at 4,000 foot and cemented with 1,000 sacks of cement.

Q The exhibit shows 100.

A Excuse me, please correct that to 100. I misread my own numbers.

Q Did you calculate the top of the cement for the 5-1/2 inch string?

A From our experience in the area, we would anticipate about 400 foot of cement or in there back to around 3600 foot.

Q Is that in your opinion adequate to protect all producing formations in the area?

A Yes, sir.

Q And all fresh water?

A Yes.

Q What's the condition of the casing here?

A We have not inspected the casing. We anticipate from our experience in the general area that the condition will be good. In addition, of course, we have an annulus between our 5-1/2 inch casing and our 9-5/8ths. There is no real question but this injection water couldn't go into the fresh water strata,

but in any event, just in our normal waterflood operations and in trying to control our injection, we will maintain an observation of the pressure on the annulus between the 9-5/8ths and the 5-1/2 and should the production casing fail, we will of necessity correct it and we will be able to observe any failure that might occur.

Q How do you propose to inject, through the casing or through the tubing?

A We propose to inject down the casing. This is being done on the offset Boller-Nichols project successfully, and we anticipate that we will be able to successfully inject in that manner, also.

Q Is the water you are using fresh water?

A Yes, sir.

Q You have no danger of corrosion to the water supply, is that correct?

A We do not anticipate any particular abnormal corrosion problem, no, sir.

Q Do you have any estimate as to the amount of water the well will take?

A The only estimate we could make would be by judging the Boller-Nichols experience to the south. Our injection rates will be designed to cooperate across this common boundary to where a near equal amount of water will be injected to keep the production stabilized in the area.

Q Would that fall within the 100 to 500 barrels per day figure that you have given?

A That's our present target.

Q That would be adjusted to fix the injection program across the lease line?

A Yes, sir.

Q Do you anticipate that the well will take it on vacuum or expect that you will have to pressure it?

A We expect that we will have to inject under pressure.

Q Do you know what pressure you are talking about?

A The pressures to the south have ranged in the order of 1500 to 2,000 pounds. We might expect pressures that high.

Q Has this program -- did you submit your proposal to the Office of the State Engineer?

A Yes, sir. I have included a copy of our letter to the State Engineer which transmitted a copy of our application to the New Mexico Oil Conservation Commission.

Q And that is your Exhibit No. 8 in your Exhibit A?

A That is correct.

Q Do you have anything further to add, Mr. Czirr?

A I believe not. At this time we can say that our well is capable of producing the top waterflood allowable rate without water production, we are not at this moment producing water from our Kennedy State Well No. 2.

Q Were Exhibits 1 through 8 of Exhibit A prepared by you

or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time we would like to offer in evidence the exhibits contained in Exhibit A, being Nos. 1 through 8.

MR. UTZ: Exhibit A in eight parts will be accepted into the record of this case.

(Whereupon, Applicant's Exhibit A, Nos. 1 through 8, admitted in evidence.)

MR. KELLAHIN: That's all I have on the direct examination.

CROSS EXAMINATION

BY MR. UTZ:

Q How old is the casing in the No. 1 Well?

A The well was completed in 1949.

Q What kind of a test do you intend to make on this casing to be sure it will hold your 1500 pounds pressure?

A In all probability we will, by running injection profile surveys, but insofar as the test would be concerned, we will have an automatic test by injecting into the well. Should any pressure loss be encountered on our 5-1/2 - 9-5/8 casing annulus, then we would be obligated just to either run a packer or repair the casing as a matter of normal operations.

Q In most cases, I will advise you that the Commission usually, where injection is through casing, requires a 2,000

pound test on the casing prior to injection. If the casing doesn't stand this, then the alternative is to repair the casing or check it out below the packer. Would you be willing to run this 2,000 pound test prior to injection?

A If it is a requirement with the Commission, we can assure you we will be willing to.

Q On your production graphs in the Exhibit A --

A It's Exhibit 3.

Q -- in the latter part, or the middle of 1962, your Kennedy State No. 2 shows considerable response, is that true?

A That's correct.

Q The flood to the south. Do you have any explanation why your Kennedy State No. 1 didn't show any response?

A My opinion would be probably, or my opinion is that probably what happened is that our No. 2 Well is directly offset by injection well. The Phillips Kennedy State No. 1 Well is immediately offset to the south by a producing well. I think that would be the most logical explanation as to why it had not responded similarly to the No. 2 Well.

Q At any rate, you don't feel there's any question but what the communication between the producing zones of your 1 and 2 wells exists?

A Not at all, no, sir.

MR. UTZ: Any other questions of the witness? The witness may be excused.

(Witness excused.)

MR. UTZ: Any other statements in this case? The case will be taken under advisement.

* * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, a 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 10th day of May, 1963.

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. 2799 heard by me on May 24, 1963.

Elvis A. Utz, Examiner
New Mexico Oil Conservation Commission