EXAMINER HEARING
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 9, 1958

IN THE MATTER OF: Case No. 1415

TRANSCRIPT OF PROCEEDINGS

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IN THE MATTER OF:

Application of Phillips Petroleum Company for authority to effect an oil-oil dual completion and to commingle the production from two separate pools. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its Santa Fe Well No. 18, located in the NW/4 NE/4 of Section 34, Township 17 South, Range 35 East, Lea County, New Mexico, in such a manner as to produce oil from the Yates formation adjacent to the Vacuum-Yates Pool and from the Vacuum (San Andres) Pool through parallel strings of tubing. Applicant further seeks authority to commingle the oil produced from the separate reservoirs in common storage after measuring the Yates oil through dump-type meters. Case 1415

BEFORE: Elvis A. Utz, Examiner

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MR. UTZ: We will take up next Case 1415.

MR. PAYNE: Case 1415: Application of Phillips Petroleum Company for authority to effect an oil-oil dual completion and to commingle the production from two separate pools.

MR. MORGAN: I am Forrest Morgan, representing Phillips Petroleum Company. I am the only witness and would like to be sworn.

(Witness sworn.)

MR. MORGAN: I have not previously qualified before the Commission.

FORREST C. MORGAN

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

DIRECT EXAMINATION

By MR. PAYNE:

Q Would you state your name and position, please?

A My name is Forrest C. Morgan, assistant district superintendent at the Hobbs, New Mexico, district.

Q What is your educational background?

A Bachelor of Science degree in General Engineering from the University of Oklahoma.

Q What year was that?

A 1948.

Q What have you done since that time?

A I have been with Phillips in engineering work since graduation.

MR. PAYNE: Are his qualifications acceptable?

MR. UTZ: They are.

Q Would you proceed, please?

A Yes, sir. This application is to allow dual completion of our Santa Fe Well No. 18 located 660 feet from the North line and 1980 feet from the East line, Section 34, Township 17 South, Range 35 East, Lea County, New Mexico. The well is currently a

top allowable oil producer from the San Andres formation, and we wish to dual the well so as to produce from both the San Andres and Yates formations. I will now pass out Exhibit "A", and in the interest of time, I would like to pass out Exhibits "A" and "B" at the same time.

MR. UTZ: I wish you would, please.

A Exhibit "A" is a plat showing the offset operators and producing wells in the area around the subject well. The Phillips Petroleum Company acreage is shown in blue and the subject well is colored in red. This well has been selected for dual completion based on offset Yates producers to the north and west with low gas-oil ratios. Based on drilling time, sub-sea correlation, and sample logs, we anticipate the Yates to be productive in this well between 3050 feet and 3150 feet. A gamma ray-neutron log will be run prior to the actual dual completion operations.

The well has 9-5/8 inch casing set at 1633 feet with cement circulated to the surface. This will afford adequate protection to any fresh water zone.

7-inch casing is set at 4185 feet with 400 sacks of cement. The theoretical cement top is at 1260 feet which will assure separation between the two zones involved in the dual completion.

Exhibit "B", which I have already passed out, with the colors there, I'll explain here. Our plan for dual completion is to pull rods and tubing, perforate the Yates formation between 3050 and 3150 feet and set a permanent production packer at

approximately 4175 feet. The tubing and rods will then be run in the manner shown on Exhibit "B". Any required treatment of the Yates will be done after all tubing strings are run and landed. It may be noted that our proposed hookup will afford positive separation between the two zones during all future anticipated well servicing and workover requirements. It will also afford the desirable features of single completed wells such as pump submergence and provisions for venting free gas.

The brown color on Exhibit "B" shows the San Andres oil entering the pump and being discharged into hollow polished rods through a blind cage on top of the pump. The oil progresses upward to a point above a metal pack-off assembly. From there, it enters the sucker rod - tubing annulus and flows to the surface in the conventional manner. The pump will be set near total depth and adequate space will be provided to permit maintaining a pumping fluid level below the packer. San Andres free gas, shown in yellow, will be vented to the surface through a 3/4 inch or larger tubing string. I would like to emphasize that the metal pack-off assembly shown on the schematic pertains to San Andres production only and is not related to zone separation. It will be noted that San Andres pump jobs and rod jobs can be performed without any possibility of zone communication. If a tubing leak should occur in the plastic coated 2 inch CS Hydril string above the packer, it can be replaced without possibility of communication by closing the Garret sleeve below the packer, running a blanking choke in the seating nipple,

and releasing the tubing from the C-2 latching receptacle. Repair on the 3/4 inch or larger tubing could also be performed without commingling by this same procedure. Repair of the 2 inch EU tubing serving the Yates can also be performed without possibility of commingling. It may be noted that the Yates can be artificially lifted at any future date simply by running a rod string and pump. The hookup will afford pump submergence and provisions for venting Yates free gas as in any singly completed well.

The hookup will also permit corrosion inhibition of both zones if later required. This equipment has been used in other similar installations by Phillips Petroleum Company in Okalhoma and Texas, and is considered an accepted method of producing dually completed wells.

We plan to conduct a packer leakage test after dual completion of the well and at other intervals as specified by the Commission.

Based on other operators information, we anticipate a bottom-hole pressure in the Yates of approximately 1700 psi. The San Andres bottom-hole pressure now approximates 775 pounds per square inch. The packer will easily handle this small pressure differential.

The Yates oil gravity is 36 degrees API and the San Andres gravity is 37.6 degrees, which will permit detection of any subsurface communication.

We propose dual completion of this well rather than a new Yates single completion because we consider our proposed arrangement

sound and because a savings of $10,157 will result by dual completion rather than drilling a separate Yates well.

As a further part of this application, we propose to produce Yates and San Andres crudes into common storage. The Yates oil will be produced and measured through a metering separator incorporating a cyclic type dump meter. San Andres production will be determined by deducting Yates oil from the total gauged production.

Royalty interests are identical on the Yates and San Andres zones. The only basis for separately measuring the two crudes is for accounting purposes with the Commission and reservoir purposes in our own company.

Metering separators have been used by our company in New Mexico, West Texas, Oklahoma, and Kansas. This experience has conclusively proven their reliability and accuracy. Producing the Yates and San Andres zones into common storage will effect a savings of $3,684 to Phillips Petroleum Company. This will also permit production to a lower economic limit on both zones and thus effect conservation.

This concludes my testimony unless there are other questions, and I would like to move that Exhibits "A" and "B" be placed in evidence.

MR. UTZ: Is there objection to Exhibits "A" and "B"?

MR. PAYNE: Were these exhibits prepared by you or under your direction?

A Under my direction.

MR. UTZ: If there is no objection, they will be received. Any questions of the witness? Mr. Nutter.

CROSS EXAMINATION

By MR. NUTTER:

Q Mr. Morgan, I didn't catch it when you gave the bottom-hole pressure for the Yates formation.

A 1700.

Q And 775 for the San Andres?

A Yes, sir.

Q What are the two GOR's for those two zones?

A Our present gas-oil ratio on our Santa Fe Well is 529.

Q That is in the San Andres?

A That is the San Andres gas-oil ratio. The gas-oil ratio -- we have two Yates wells that are direct offsets to us; the one to the north has a gas-oil ratio of 1980 and the one to the west has a gas-oil ratio of 1318.

Q Which is the newer well?

A I believe that the Standard of Texas Well is the newer well, that would be the north well.

Q That is the one with the GOR of --

A (Interrupting) 1980.

Q Mr. Morgan, in effect, what the installing of this 3/4 inch macaroni tubing string does for this dual completion is add a casing annulus?

A Yes, that is exactly it. We have prepared theoretical curves

which we have confirmed by field analysis, showing the effect of pump gas on volumetric efficiency. We have concluded that anything normally above 600 gas-oil ratio cannot be pumped with any reasonable efficiency. Where we have a gas-oil ratio above that, that would adversely affect efficiency, we provide facilities for venting the gas. In other words, we anticipate that this will be equivalent to a singly completed well, as near as we can make it.

Q You have created an artificial casing annulus?

A Yes, we have two casing annulus' in this well.

Q Is the gas vented in this field?

A No, it is in the Vacuum Field and Phillips Petroleum gathers gas.

Q What are the mechanics of the seal which is obtained in this DS 2092 take-off collar with the landing receptacle, and all this business here? Are these components actually integral parts of the tubing string, screwed into the tubing string, or dependent on rubber seals, or what?

A No, sir. The DS 2092 is actually screwed in as an integral part of the tubing string. It has an ID such that you can actually use it as, in essence, a pump hold-down. The ID on the one that we are planning to use, I believe, is 1.830 and then you also have an assembly that you run on your rod string and you do two things with that: first, you lock it in place, it has a mechanical lock on the bottom; and it also has a metal-to-metal seal at the top.

Q How about this Baker C-2 latching receptacle? What does that depend on to assure no communication?

A That is exactly the same seal as you have in any Baker 415-D packer. You have a machine surface and your seal assembly fitting into it. That was put in there simply to give us added assurance that we could do any future work that comes up without any possibility of commingling. In other words, we can replace tubing.

Q Do you happen to have any brochures put out by the manufacturer of this landing receptacle and so forth?

A I have a manufacturer's representative with me. He is well equipped, he would be more than happy to testify or pass the bulletins out.

Q I think it would be well, inasmuch as this type of installation has not been proved heretofore, to at least have the brochure with the pictures of the machine entered as an exhibit in this case.

A We have abundant copies and we would be glad to do that. I would like to point out that the DS 2092 is not a new tool. We simply borrowed a tube to do what we wanted to from two tubing arrangements that we have used for five years.

Could you give me the pictures of your tools on that, and we will enter those?

MR. UTZ: Do you have them with you now?

MR. NUTTER: If those can be mailed in, that will be

satisfactory.

A We will bring them here as soon as I'm released, to you.

Q Did I understand you to say that you would receive the oil from both zones in common storage after metering the Yates oil through dump type meters?

A That is correct. A metering separator that incorporates a cyclic-type dump meter.

Q That would have a separator attached as part of it?

A It is a separator with just a built-in metering device in it.

Q How would you determine the volume of oil produced from the San Andres?

A In other words, we will have a manual gauge each day; all you would do is deduct the meter reading from the Yates oil from the total gauged production.

Q Is there not a possibility that the volume of the oil will change after it has been run into the tank, that the measured difference might not truly reflect the amount of oil that was produced from the San Andres?

A Mr. Nutter, that is a good question, and we run extensive tests here two years ago in our Ardmore District to confirm just exactly that. Our findings were that if we calibrated the metering vessel at the time we installed it, over a year's time we had minor variations, essentially there was none.

Q Are you acquainted with Commission Order No. R-1093 which

the Commission entered in Case No. 1337 on November 27, 1957, authorizing the Gulf Oil Corporation to commingle production from two separate pools?

A No, sir, I am not familiar with that order.

Q I think if you will read that order, you will find that the Commission authorized the commingling but only after the production from the two zones had been metered separately.

A They used independent meters rather than the deduction?

Q Yes, sir.

A I see. No, sir, I was not aware; this was our recommended approach and we had no background on it.

Q Would Phillips Petroleum Company be willing to install separate meters for the two zones?

A We would, if the Commission desired. We would be more than glad to install a separate metering vessel for the San Andres crude.

MR. NUTTER: I believe that is all.

MR. UTZ: Any other questions of the witness? If not, the witness may be excused.

(Witness excused.)

MR. UTZ: Do you wish to introduce this brochure as Exhibit No. 3?

MR. MORGAN: As "C", I used "A","B", and "C".

MR. UTZ: Is there objection to the brochure as Exhibit No. "C"? If not, it will be accepted. Any other statements in this case? If not, the case will be taken under advisement.

We have three other cases, and I think it will take better than an hour to complete them. We will not be able to have this Hall tomorrow. If the interested parties will report in the Commission office in the morning, we will have a place to complete the hearings.

The hearing will be adjourned until 9:00 o'clock in the morning.

(Recess.)

C E R T I F I C A T E

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 Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 3rd day of May, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:

June 19, 1959.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1415, heard by me on April 9, 1958.

..., Examiner
New Mexico Oil Conservation Commission