BEFORE THE
OIL CONSERVATION COMMISSION
EXAMINER HEARING
Santa Fe, New Mexico
June 24, 1959

IN THE MATTER OF: Case 1699

TRANSCRIPT OF HEARING

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ALBUQUERQUE, NEW MEXICO
3-6691 5-9546

BEFORE THE
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IN THE MATTER OF:	
Application of J. W. Brown for an order authorizing a pilot water flood project. Applicant, in the above-styled cause seeks an order authorizing it to institute a pilot water flood project in the Brown Pool, Chaves County, New Mexico, by the injection of water into the Queen formation through four wells located in the SE/4 NW/4 of Section 26, Township 10 South, Range 26 East, Chaves County, New Mexico.	Case 1699

BEFORE:

Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The next case on the docket will be 1699.

MR. PAYNE: Case 1699: Application of J. W. Brown for an order authorizing a pilot water flood project.

MR. CAMPBELL: Jack M. Campbell, Campbell and Russell, Roswell, New Mexico, appearing on behalf of the Applicant. We will have one witness. Mr. Nichols, will you come up, please?

(Witness sworn.)

MR. UTZ: Are there other appearances to be made in this case? If not, you may proceed.

N. B. NICHOLS

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

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A N. B. Nichols.

Q Where do you live, Mr. Nichols?

A Roswell, New Mexico.

Q What is your profession?

A Consulting petroleum geologist.

Q Have you ever testified before the New Mexico Oil Conservation Commission or any of its Examiners?

A No, sir, I haven't.

Q Will you please give the Examiner a brief resume of your education and professional background?

A I was graduated from Texas Technological College in Lubbock, 1950, with a B. S. degree in Petroleum Geology; was employed by Standard Oil Company of Texas in 1951 and was in their employment until 1957 in the capacity of development geologist and district development geologist in the Production Department. From 1957 to 1959 I was employed by Wartex Exploration Company interested primarily in primary production.

Q Have you had any experience in connection with secondary recovery?

A Yes, sir, during my employment with Standard Oil Company of Texas, I worked directly with the water flood projects in Ward, Winkler, and Loving County, Texas, as district geologist;

and we made the first evaluation of an area which we anticipated or thought might possibly respond to repressuring by water. It was up to our department to instigate these, and very much of the primary work done on those wells was done by my department.

MR. CAMPBELL: Are the witness's qualifications acceptable?

MR. UTZ: Yes, they are.

Q (By Mr. Campbell) Mr. Nichols, have you been employed by J. W. Brown as a consultant in connection with a possible pilot water flood project in Section 26, Township 10 South, Range 26 East, Chaves County, New Mexico?

A Yes, sir, I have.

Q In connection with that, have you made a study of the presently existing wells, the cumulative production, and so on, in connection with the area?

A Yes, sir, I have.

(Applicant's Exhibits 1 through 4 marked for identification.)

Q I will refer you, Mr. Nichols, to what has been identified as Applicant's No. 1 and ask you to state what that is, please.

A This is a plat of the J. W. Brown State Lease located Section 26, Township 10 South, Range 26 East, Chaves County. It shows the development to date to the Brown Queen Pool pay. There are now five producing wells on the lease, and there have been two

additional wells. This plat also shows the proposed pilot flood, which the proposed injection wells are circled with larger circles and are connected by dashed line. You will note that Well No. 6 and Well No. 8 are two plain circles. It was meant to be that way, although No. 6 is almost filled in. This is to show that these wells have never been completed as a producer or injection well. These wells were drilled primarily for reservoir data and we drilled and cored those wells, cemented the pipe through the pay section, and they are standing. They have never produced and were drilled primarily for reservoir data and to fulfill the low five-spot pattern we have.

You will note that Wells No. 2 and 3 are now producing wells which are proposed to be converted to injection wells. Our Well No. 1 will be the central producer in this proposed pilot flood.

Q What is the depth of the oil producing formation?

A From 720 to 790 feet, depending upon the structure location of the well.

Q Will you give the Examiner a brief history of the drilling of the wells in this area and a little bit about the cumulative oil production to date from those wells?

A The first indication of Queen production here was in 1941 in the J. W. Brown No. 1 State. Although this well was not completed, several attempts were made by shooting, and was left temporarily abandoned until 1956. However, the discovery well for

the Pool will be No. 2, which was drilled in 1949 but again was temporarily abandoned and re-worked in 1955. After re-working Well No. 2 and completing it from the Queen pay, Well No. 1 was re-entered and Wells 3, 4, and 5 were drilled and completed from the pay. These wells 3, 4, and 5 were drilled in 1957.

Q What has been the production history?

A The production has been nil on all these wells except immediately after treatment; all these wells responded not at all to nitroglycerin shots,but to a sand fracture treatment the wells responded rapidly and satisfactorily; but had a very fast decline from 20 and 30 barrels down to 1 and 2 barrels inside of eight months.

Q All the wells on the J. W. Brown State Lease and in the proposed pilot area, what is their present production?

A Well No. 1 is presently producing about two barrels a day, Well No. 3 about 3 barrels per day, Well No. 2 about 1 barrel per day.

Q Then it is your opinion, I assume, that this is definitely a marginal situation?

A Certainly is, primarily.

Q What has been the cumulative production of oil from all of these wells?

A Cumulative production to January the 1st, 1959, from five wells was 6,650 barrels.

Q I refer you to what has been identified as Applicant's

Exhibit No. 2 and ask you to state what that is, please.

A This is the Brown No. 6 State, which was drilled in the summer of 1958 almost solely for reservoir data. The wells drilled up to this time, we had no cores or no core analysis and some of these were drilled with cable tools and very little reservoir data. In June of 1958, we went in and drilled this well solely for this reservoir data, and run pipe on the well and it has been standing since that time. Of course, the reserves which are shown on this core graph and on the tabulation which accompanies this report indicate that we aren't getting the oil that is in this reservoir.

Q I refer you to what has been identified as Applicant's Exhibit 3 and ask you to state what that is, please.

A This is a core graph on the J. W. Brown State No. 8, drilled in May of 1959. Again this was a well drilled for additional reservoir data and to complete the five-spot pattern which we have circled here on the plat Exhibit 1. Again the core graph shows there are reserves here which we haven't been able to get out. These wells were drilled near two producing wells, which should have drained and should be comparable to these wells, and they haven't produced primarily any appreciable oil, and we have drilled and cored on each side of these wells, and we feel very confident the oil is in the well that we have produced for drilled years but not been able to get any primary reserves out of.

Q Do the studies of the Core Laboratories indicate that

there is a possibility that by water injection you may be able to recover a substantial amount of oil reserves that would not otherwise be recoverable?

A They do.

Q Have you made, in connection with those core reports, any independent studies to indicate what potentially may ultimately be recoverable from this area?

A I have. I have made a thorough study of this area and it is my opinion that we can recover approximately a hundred fifty barrels per acre foot under the acreage which we have developed to date by secondary recovery. This is considerably less than is given by core analysis, but there are some assumptions and limitations in this. We do have a fairly low permeable zone, our porosities are low, but in each case they are sufficient to inject water into, so we have in all probability been very conservative on this recovery per acre foot by water flood. We have brought it down considerably from the Core Laboratories report, but we do think there is sufficiently more than we have recovered by primary. We have to date, according to my best calculations, recovered two barrels per acre foot of primary.

Q Is this an operation that is sound in the economic sense?

A Two barrels per acre foot, I don't think so.

Q Do you believe that unless some attempt is made by secondary recovery methods to obtain this oil that it would be

necessary to abandon the area insofar as oil production is concerned?

A It almost surely would be.

Q Mr. Nichols, where do you intend to get the water for this program in the event it is approved?

A We are now testing a zone at 400 feet on a well located in Section 23, designated the M. G. Peters No. 1 Gulf State, which is shown as a dry hole on Exhibit 1.

Q Have you obtained some water from that?

A We have.

Q Have you had it tested?

A We have.

Q I refer you to what has been identified as Applicant's Exhibit No. 4 and ask you to state what that is, please.

A This is water analysis made of the water which we recovered from the M. G. Peters No. 1 Gulf State during the time it was being drilled in 1958, recovered by baling at a depth of 400 feet. This was sent to the Treat-Right Laboratory in Monahans, Texas, for complete analyses which are attached, which shows this to be a salt water. We have attached to this report recommendations from the Treat-Right Company of the nature of the water and what would be necessary to use this water as injection into the Queen Reservoir.

Q You would pipe that water from that M. G. Peters Gulf State No. 1 Well down to the injection wells in J. W. Brown

State Lease, is that correct?

A Right.

Q Do you have any indication on that as to the quantity of water you may have available?

A Our latest tests indicate 240 barrels per day, which needless to say is insufficient, which would be enough to start our pilot while we search for additional water.

Q Would you contemplate drilling water wells to that same depth to the one you are going to initially?

A Yes, we do contemplate additional drilling to that same formation.

Q You believe you have adequate water source to commence the project?

A Yes, sir.

Q Do you believe that if this project is undertaken it will promote conservation in that you will possibly obtain a greater ultimate recovery of oil than would otherwise be obtained?

A Yes, sir.

Q Was Exhibit 1 prepared by you or under your supervision?

A Yes, sir.

Q Do you have anything further you would like to add in connection with this matter?

A The only thing, it's all been brought out here, but I would say that we do have some more testing on the water. We

are pumping the well now to get a good clean sample, and in all probability we will have that water ready for injection in the near future. As outlined in the recommendations on the water, we are planning to inject this water through cement-lined tubing on our casing below the packer. The condition of the wells, all have good pipe in them but they are not protected for the salt water which we are anticipating using, so our injection wells will carry cement-lined tubing set on a production packer and we'll be injecting that below the reservoir.

MR. CAMPBELL: I would like to offer Applicant's Exhibits 1, 2, 3, and 4 in evidence.

MR. UTZ: Without objection Exhibits 1 through 4 will be accepted in evidence.

MR. CAMPBELL: That's all the questions I have at this time.

MR. UTZ: Are there questions of the witness?

MR. PAYNE: Yes, sir.

MR. UTZ: Mr. Payne.

CROSS EXAMINATION

BY MR. PAYNE:

Q Could you give me the locations of the No. 1, 2, 3, 6 and 8 Wells?

A Well No. 1 is 1980 feet from the west line, 1980 feet from the north line, Section 26, Township 10 South, Range 26 East. What was the next well?

Q The No. 2.

A The No. 2 Well is 2310 feet from the north line, 2310 feet from the east line of Section 26.

Q And the No. 3?

A The No. 3 is 1650 feet from the north and 1650 feet from the west of Section 26.

Q And the No. 6 Well?

A 2310 feet from the west, 1650 feet from the north, Section 26.

Q And the No. 8?

A 1650 feet from the west and 2310 feet from the north, Section 26.

Q Now, Mr. Nichols, do you propose to expand this pilot flood, or is this it, so to speak?

A The plan will most surely be expanded, if successful.

Q Do you propose to follow the recommendations made by the Treat-Right Water Laboratories?

A We are to the extent that, as stated in this letter, they would like another sample after we have produced the well some. We do plan on following their recommendations, and particularly after we get them the next sample which we think will be less contaminated than this. As stated, this was a sample taken with a baler while we were drilling the well.

Q Do you think it might be a good idea -- you say you are going to use tubing in the injection wells to run sweet oil

in the annular space. Do you think that would be a good protective measure?

A It might possibly be.

MR. PAYNE: That's all, thank you.

BY MR. UTZ:

Q What is your total injection zone that you propose to inject water?

A Approximately thirty feet.

Q Could you spot that on the core analysis on the No. 6 and 8 Wells?

A That would be from 720 to 758 on No. 8 Well.

Q 720 to 758?

A And from 754 to 791 in the No. 6 Well.

Q To 790?

A Right -- 91, beg your pardon.

Q The first one was 723 to 58?

A To 59.

Q How about the No. 2 and 3, would that be about the same?

A Right. We, of course, anticipate logging these wells and getting a little better information on them; the older wells which we have no information to speak of at present. We do know where the casing is and where the total depth of those wells, and that's about the size of it, and how much oil was produced from them.

BY MR. PAYNE:

Q You don't feel that the injection interval would be in excess of 700 to 800 feet, do you?

A No -- beg your pardon?

Q The total injection interval, not looking at the individual wells but any of them, would the injection interval exceed the distance from 700 to 800 feet?

A No, sir, it wouldn't. On the north edge, if the plan, the flood is expanded, the pay section ranges from around 700 to 750; on the south we will never get below 800 feet, I don't think, on our total depth of our pay there. I think the water will be restricted to the interval of 700 to 800 feet over the entire lease.

MR. PAYNE: Thank you.

BY MR. UTZ:

Q Mr. Nichols, referring to your core analysis on the No. 6 Well, it looks as though you had very good permeability in the lower section. Why aren't you going to flood that?

A Well No. 6?

Q Yes, sir.

A What interval are you speaking of?

Q In the vicinity of 786 to 789.

A I believe I stated that we would flood that from 750 to 791 -- 754, which would include that whole interval, would it not?

Q I understood that to be the No. 8.

A You will note where the permeability is the greatest there, our porosity drops tremendously, which is quite a phenomena in itself.

Q Is the interval perforated in the No. 1 in the same interval as No. 6 and No. 8?

A The interval opened in No. 1 is from 758 to 785, based on the information we have gotten from these two cores we anticipate having to perforate a little of the section to open it all up. We think we have ten feet of our pay section cased off there.

MR. UTZ: Any other questions of the witness? If there are none, the witness may be excused.

(Witness excused.)

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

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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 was reported by me in Stenotype, and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill, and ability.

DATED this 2nd day of July, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

NOTARY PUBLIC

My Commission Expires:

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1689, heard by me on June 24, 1959.

Examiner
New Mexico Oil Conservation Commission

STATE OF NEW MEXICO)
)
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 by me, 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, the 5TH day of July, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1963.