CASE 2573: Application of Phillips Petroleum Company for approval of an unorthodox oil well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval to locate its Santa Fe Well No. 68 at an unorthodox oil well location in the Vacuum-Abo Pool, 1650 feet from the North line and 1090 feet from the East line of Section 34, Township 17 South, Range 35 East, Lea County, New Mexico.

CASE 2574: Application of J. Gregory Merrion and Associates for compulsory pooling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order of the Commission force pooling all interests in the Basin-Dakota Pool in the W/2 of Section 35, Township 25 North, Range 6 West, Rio Arriba County, New Mexico.

CASE 2575: Application of Val R. Reese & Associates, Inc. for the creation of a new oil pool and for special pool rules, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Gallup production in Township 23 North, Range 7 West, Rio Arriba County, New Mexico, and further seeks the adoption of special rules and regulations for said pool similar to the special rules presently governing the Escrito-Gallup Oil Pool which provide for 320-acre gas proration units and 80-acre oil proration units (Order No. R-1793-A).

CASE 2576: Application of Sinclair Oil & Gas Company for approval of a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a waterflood project in the Grayburg-Jackson Pool, Eddy County, New Mexico, with the injection of water to be through seven wells located on the H. E. West "A" and "B" leases in Sections 3 and 4, Township 17 South, Range 31 East; applicant proposes to operate the waterflood project under the provisions of Rule 701.

CASE 2577: Application of Newmont Oil Company for approval to drill a water injection well, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks permission to drill the State "A" Well No. 3, to be located 1295 feet from the South line and 2615 feet from the East line of Section 36, Township 17 South, Range 29 East, Eddy County, New Mexico, for use as a water injection well in the Loco Hills Pool Waterflood Project.

CASE 2578: Application of Newmont Oil Company for approval of a development plan for the Loco Hills Waterflood Project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a plan of development for the Loco Hills Waterflood Project, Eddy County, New Mexico, which would permit

CASE 2578: (Continued)
the conversion of wells to water injection by stages. The applicant proposes to operate said waterflood project under the terms and conditions of Order No. R-2178 which established a buffer zone in a portion of the project area.

CASE 2579: Application of Neil E. Salsich for approval of a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a waterflood project in the Square Lake Pool with the injection of water into the Grayburg formation of the Square Lake Pool through five wells located in Section 36, Township 16 South, Range 29 East, Eddy County, New Mexico. Applicant requests that the waterflood be governed by Rule 701 except that administrative approval is sought to allow expansion of the waterflood by the conversion of one additional well in Unit H of Section 35 prior to response from water injection.

CASE 2580: Application of Waterflood Associates, Inc., for approval of a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a waterflood project in the Robinson Pool with the injection of water to be through six wells located in Section 35, Township 16 South, Range 31 East, Eddy County, New Mexico; applicant requests that the waterflood project be governed by Rule 701.

CASE 2581: Application of Waterflood Associates, Inc. for approval of a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a waterflood project in the Square Lake Pool by the injection of water to be through two wells located in the NE/4 of Section 3, Township 17 South, Range 30 East, Eddy County, New Mexico; applicant requests that the waterflood project be governed by Rule 701.

CASE 2582: Applicant of Waterflood Associates, Inc., for approval of a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a waterflood project in the Artesia Pool by the injection of water to be through one well located in the W/2 NW/4 of Section 21, Township 18 South, Range 28 East, Eddy County, New Mexico; applicant requests that the waterflood project be governed by Rule 701.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

June 7, 1962

EXAMINER HEARING

IN THE MATTER OF:
Application of Waterflood Associates, Inc. for approval of a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a waterflood project in the Robinson Pool with the injection of water to be through six wells located in Section 35, Township 16 South, Range 31 East, Eddy County, New Mexico; applicant requests that the water-flood project be governed by Rule 701.

Case No. 2580

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: The Hearing will come to order, please. The next case will be 2580.

MR. MORRIS: Application of Waterflood Associates for approval of a waterflood project.

MR. LOSEE: A. J. Losee, Losee and Stewart, Artesia, New Mexico, appearing for the applicant. I have one witness, Mr. Porter.

(Witness sworn.)

MR. LOSEE: If the Examiner will pardon us for a moment.

(Discussion off the record.)

HAROLD PORTER,

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

DIRECT EXAMINATION

BY MR. LOSEE:

(Whereupon Applicant's Exhibits 1 through 10 marked for identification.)

Q State your name, please, sir.

A Harold Porter.

Q You live in Artesia?

A Yes, sir.

Q What's your occupation?

A I'm a petroleum engineer.

Q Have you previously testified before this Commission and your qualifications as an expert been accepted?

A Yes, sir.

MR. LOSEE: Is the witness acceptable?

MR. NUTTER: Yes, sir.

Q (by Mr. Losee) Please refer to what has been marked Exhibit No. 1 and state what that is, sir.

Q Exhibit No. 1 is a plat of the Robinson Field area with the Waterflood Associates, Inc., properties outlined in yellow. I would like to draw attention to the Southwest Quarter of the

of the Southwest Quarter of Section 35, which is marked B.T.A. Oil, and state that a deal has been made to acquire that and the papers are being prepared right now, so therefore that is subject to this deal, Waterflood Associates, also.

Q In other words, Waterflood is going to acquire the Southwest Southwest of Section 35, under a present trade with B. T. A.?

A Yes, sir.

Q Does this plat show the leases and wells within the two mile or mile area of the project area?

A Yes, sir. It shows the mile north, south and west and two miles east.

Q The Waterflood leases involved are the Carper lease and the Kennedy lease and then this B. T. A. lease?

A Yes, sir, that's correct.

Q Those are all leases in which the royalty owner is the United States?

A Yes, sir, these are Federal leases.

Q Please refer to Exhibit No. 2 and explain what it portrays.

A Exhibit No. 2 is a plat showing the proposed waterflood pattern. This is a normal expansion of the pattern existing in the Square Lake Pool in the Newmont Oil Company flood and for the approved wells in Section 34. Also, it is the same normal expansion as the Sinclair application, which was heard earlier

today.

We are applying in this application for four conversions, these wells being the Kennedy-Johnson "A" No. 4, being in the "E" location; and Kennedy-Johnson "A" No. 5, being in the "O" location; the Carper-Johnson "A" No. 1, being in the "G" location; and the Carper-Johnson "A" No. 3 being in the "K" location. All these will be conversions.

We are also applying for injection wells in the Southwest Southwest, which will be drilled and also an injection location in the "C" location of Section 35, which will be a new well. Also, on this map it shows the possible future expansion of this thing, this particular pattern, to include the other wells, but we are not asking for any further injection wells at this time.

Q Then the project area which is owned by Waterflood Associates would encompass all of this Section 35 except the East Half, Southeast Quarter?

A The East Half, Southeast Quarter is owned by DOB Oil Properties, Inc. The rest of the Section is owned by Waterflood Associates. As far as the project area is concerned, it is described in Rule 701, and that would be that which is directly offsetting or diagonally offsetting the injection wells, and I don't know whether it would include the whole section or not.

Q Refer to Exhibit 3A and state what that portrays.

A Exhibit 3A is a tabulation of the production history from the Waterflood Associates wells in this area, from 1946 up

through 1961.

Q Actually, this covers other leases other than the Carper lease and the Kennedy lease covered by this application, does it not?

A Yes, sir, it does. It also includes the Waterflood Associates Robinson lease in Section 25, and the Taylor lease in Section 30, which is on the plat Exhibit No. 2. The purpose of this exhibit is to show the state of depletion of these wells. The wells are actually averaging on the order of a barrel and a half per well per day. These wells have produced near 700,000 barrels of primary oil to date.

Q How many wells, do you know, are included in this history chart?

A There are seventeen.

Q Seventeen. Please refer to Exhibit 3B.

A Exhibit 3B is a graphic presentation of the data contained in Exhibit 3A. It shows the primary history and the primary decline of the wells. These wells are in what is known as an advance stage of primary depletion and are commonly referred to as stripper wells. The wells, however, do have considerable secondary reserves, which may be recovered by waterflooding.

Q Please refer to Exhibit 4 and explain what it portrays.

A Exhibit 4 is a plat showing three things, the cumulative production to January the 1st, 1961, in thousands of barrels

beneath each well, and then the next number is the current production in barrels per day, average, and the next figure is the year, the completion date. You will notice that the -- referring to the Johnson leases there in Section 35 -- that the second number indicating the barrels per day is in each case less than 6 barrels per day for each well, which would, in my estimation, justify the calling of these wells stripper wells. The lines on the map indicate iso-cumulative recovery lines whereby, for instance in Section 35 everything inside of the line drawn there has produced 50,000 barrels per well or more.

Q One of those wells, the Carper-Johnson 1A, Waterflood Carper-Johnson 1, has produced approximately 138,000 barrels of primary.

A Yes, that is right.

Q It's now producing three barrels?

A Per day, yes, sir.

Q And it was completed in 1937?

A Yes, sir. In the event it's confusing to anyone, the well marked Carper-Johnson "A" No. 3 and shown here as a dry hole, is not a dry hole. It is a well which was junked when it was drilled and subsequently plugged and a replacement well was dug.

Q Which is the 3-X well?

A Yes, sir.

MR. NUTTER: The production figures are for the 3-X?

A Yes.

Q (by Mr. Losee) Please refer to Exhibit No. 4A and explain what it portrays.

A Exhibit No. 4A is a compilation of the well data for each well in the area which Waterflood Associates owns. It shows the location, the elevations, completion dates, casing program, total depths and remarks. I would like to refer to the injection wells which are Kennedy-Johnson "A"4 and 5, Carper-Johnson "A" 1 and 3. In each instance, with the exception of Kennedy-Johnson A" No. 4, 8 5/8ths surface casing is set into the salt formation, the salt formation estimated here at 700 feet below the surface. In each instance the surface casing is cemented with 50 sacks, the long string is set at a depth somewhere above the pay a short distance and cemented with 100 sacks. And surface shallow water that exists in the area would be protected by two strings of casing and two cement jobs. It is felt that this would justify our injecting of water down the casing with no detrimental effects on any surface water which might be in the area. I would like to state also that we have drilled four holes using air as a drilling fluid searching for water and have encountered none.

Q Where have you drilled those wells?

A We drilled one 30 feet to the east of the well shown in Section 35 as Carper-Johnson "A" No. 5, it being in the "B" location. Also, we drilled a well up in Section 25, near the Carper-Federal No. 1, near the Robinson No. 1, and near the

the Robinson No. 5, each of these being drilled to a depth of 425 feet without encountering any water.

Q Was the purpose of drilling those wells to see if there was any available water in the area?

A Yes.

Q Your testimony with respect to cement of the casing applied to all except the Kennedy-Johnson 4-A, what kind of cement do you have in that instance?

A The Kennedy-Johnson 4-A has 5½-inch pipe set at 56 feet that's not cemented. However, the long string is cemented back to the surface, which we feel will properly and satisfactorily protect any surface water which might be present.

Q Please refer to Exhibit 4B and explain what it portrays.

A Exhibit 4B is a continuation of 4A and shows further data on the various wells, such as the initial potential, the stimulation methods, the cumulative primary recovery in barrels, and the productive intervals as they were reported on the drillers' logs.

Q Do you have any electric logs of any of these four injection wells?

A No, sir, there are no electric logs on any of our wells; however, a further exhibit, I have one on an offset well which will show the producing formations.

Q These productive intervals are based on drillers' logs then?

A Yes, sir.

Q What zones are those, with respect to the four injection wells, Kennedy-Johnson "A" 4 and 5 and Carper-Johnson "A" 1 and 3?

A These wells are all completed in the premier of the Grayburg, which we refer to as Zones 5, 6 and the Lovington Sand, which is called Zone 8.

Q Please refer to your Exhibit 4C.

A Exhibit 4C is a continuation of the other 4A and B exhibits and shows the surface and production casings and the theoretical cement tops for these various wells, and referring to the closed injection wells Kennedy-Johnson "A" 4 and 5 and Carper-Johnson "A" No. 1 and 3, we can see that the cement is sufficiently high between the long string and the hole and the surface pipe in the hole to give satisfactory cement protection.

Q Please refer to Exhibit No. 6 and explain what that portrays.

A Exhibit No. 6 is a reproduction of gamma ray neutron log run on the DOB Oil Properties, Inc., Federal "C" No. 1, which is located in the East Half of the Southeast Quarter of Section 35. It's the only offsetting electric log we have available and it's presented for the purpose of showing the various producing formations. The well was cored and as you can see, is indicated Core 1, 2, 3, and 4, and the places where oil was encountered is shown just left of the place where the core

is shown as dark lines; and this well is perforated in these same places, fairly close to these same places. Also you notice that Core No. 4 is down below where the log stopped. What happened is that after they ran the log, they went in and cored, cut this other core. The Lovington Sand is also perforated in this well. However, it wasn't cored.

Q You mean it wasn't logged, it was cored but --

A It was not cored. However, it was logged, as you can see, and it was perforated. It is productive.

Q Does this log show that the Premier of the Grayburg is producing in this DOB well?

A Yes, sir, it does. These pays are shown at 3720, thereabouts, and 3752 is the zone we call the Premier. The other two zones above are what we refer to as Zone 5 in details. This well had 18 feet of net pay and from core analysis, permeability average was 2.6 millidarcies and the average porosity for these samples was 13.7 percent.

Q How do you propose to inject water into these four wells, as well as the two new wells that you will drill, by what means?

A We intend to establish plant with a pressure pump and inject down the casing. We anticipate our injection pressures will be on the order of somewhere around 1500 pounds and this is from studying other floods in the immediate area. We anticipate possible initial injection rates of 500 barrels a day,

and this is also from other people's experience right near.

Q Will your system be closed?

A Yes, sir. We will close the system and do everything in our power to keep all the oxygen away from the water, to produce corrosion.

Q What is the source of your water, or proposed source?

A We are negotiating and have come to tentative agreement with Caprock Water Company to purchase water from their water pipeline system, and we have an exhibit here which is a letter from Caprock Water Company advising us that they have the water available and will furnish the water to our plant.

Q In the event it develops that after you start injecting water through your casing that you have a leak, what would be your procedure in correcting your defect?

A Well, of course the most economic and logical solution to a problem like that would be to run a packer and set it in the casing below the leak; however, you could possibly cement squeeze the leak off. It would have to be evaluated as to the particular circumstances. However, should a leak occur, it would be our intention to remedy the situation immediately.

Q Do you think you can determine if a leak is occurring in your injection program, without the running of any pressure tests on your casing?

A Yes, sir, it would be, in the event a leak occurred, with the annulus opened to the atmosphere, the leak would nec-

essarily come up and the water would come up and come out on the surface, and you would know. Also, your injection characteristics would change drastically, that is, wellhead pressure, injection rates, if any significant leak occurred. And it is felt that we could surely tell whether or not we had any casing leaks without having to run any periodic tests on the thing.

Q Is this a logical expansion of Newmont flood to the west?

A Yes, sir, it is. As shown on the waterflood pattern, Exhibit 2, this is a logical expansion of that established pattern. We have an exhibit here, No. 8, from the Newmont Oil Company, which says that they support our application as long as we do continue the normal, logical expansion of the existing pattern.

Q Did you notify the State Engineer's office of this proposed program?

A Yes, sir.

Q Is that your Exhibit 9, a copy of your letter?

A Yes, sir, it is. Exhibit 9 is a letter to Mr. Irby of the State Engineer's office explaining our application and giving him data with respect to the wells and their completion.

Q Let me ask you about these two new wells that you will propose to drill in this program. What would your casing program be of these two new injection wells that you previously testified to, one located in the Northeast of the Northwest Quarter of this Section 35 and one down in the Southwest Southwest of 35?

flood, do you calculate, produce by way of oil?

A The secondary reserves recoverable should be on the order of one to one-and-a-half times the primary reserves recovered.

Q Are these same zones being successfully flooded by Newmont about two miles west of this flood?

A Yes, sir, they are.

Q Did you prepare Exhibits 1 through 6 or were they prepared under your direction?

A Yes, sir.

Q Exhibits 7 through 10 are copies of letters received or mailed. The applicant at this time moves to introduce Exhibits 1 through 10.

MR. NUTTER: Applicant's Exhibit 1 through 10 will be admitted into evidence.

(Whereupon Applicant's Exhibits 1 through 10 admitted in evidence.

MR. LOSEE: I have no further questions, Mr. Examiner.

MR. NUTTER: Does anyone have any questions of Mr. Porter?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Porter, now as I understand it, the six wells which you are seeking approval for in this application would be in an undrilled location in Unit "C", the Kennedy-Johnson No. 4 in "E",

A Our casing program there is to set 8 5/8ths surface casing into the salt and cement it with whatever is required to circulate the cement to the surface, then to run either 4½ or 5½-inch casing, set it through the productive zones, cement it with sufficient amount of cement to bring the top of the cement at least 200 feet above top perforations and perforate into the productive zones.

Q Would you frac those productive zones?

A It's probable that we will.

Q Did you notify the United States Geological Survey of this application?

A Yes, sir, I did, and I have Exhibit 10 which is a letter to the United States Geological Survey at Artesia, Mr. Jim Knauf, notifying him of this application and of our plans, and I have discussed this with him and he has indicated that the USGS has no objection to this plan of injection and that a letter will be forthcoming from him.

Q In your opinion, do you feel this proposed expansion of this flood will be in the interest of conservation and prevent waste?

A Yes, sir, it surely will, because this method of recovering secondary oil is an established engineering practice accepted in the industry and does and will recover oil reserves, a natural resource, which would be unrecoverable.

Q Approximately how many times primary will your secondary

Carper-Johnson No. 1 in "G", the Carper-Johnson No. 3 in "K", the B.T.A. undrilled location in "M", and the Kennedy Johnson "A" 5 in "O" of Section 35?

A Yes, sir, that's correct. May I add also that we are in discussions with DOB Oil Properties as to their conversion of their well No. 2 to injection to balance across that lease line.

Q Well, now, what was the reason for picking this particular area to be your pilot area, rather than farther up to the northwest where you also eventually will be injecting or northeast, I beg your pardon, where you will also be injecting eventually?

A Well, the reason, of course, was that we want to cooperate with Newmont across this least line as soon as they begin to inject.

Q Well, you realize this particular area here in Section 34 of Newmont's is set up on stages and isn't due for conversion until 1963, I believe?

A Yes, sir, on April 1st, I believe, is when they are scheduled to start injecting into these wells and although we propose to begin somewhat earlier there will not be a sufficiently large time lag there to cause any malfunctioning of this project. April 1st is only nine months away and it will -- we propose to begin here by the first day of September, so we will only be approximately six months ahead of them.

Q Is this, this area here, the East Half of Section 34,

is the last stage in the program that has been authorized for them?

A Yes, sir, that's right, but it does come up April the 1st, authorized for April 1st of '63.

Q That's April 1st of '63?

A Yes, sir, so it is not a sufficiently large time difference to cause any significant difference.

Q In other words, you feel that if you put your wells on by about September the 1st, that there won't be any response in their wells requiring immediate conversion to theirs prior to April 1st?

A No, sir, there shouldn't be. And besides that, we have to drill this well in the Southwest Southwest of 35, which will take a certain amount of time and also we of course will produce that well for a few months before we do convert it.

Q That looks like a good location to have gone by so long.

A Yes, sir, I think it will make a good location.

Q Now, most of the wells on your Exhibit No. 4B seem to have three pays in them, you say that that is Zones 5 and 6 and 8?

A Which exhibit, sir?

Q 4B, the perforated or productive intervals.

A Yes, sir, if you will look at that exhibit along with Exhibit 6, for instance, let's take Carper-Johnson "A" No. 1, 3680 to 3730, 3680, you will see that that covers roughly Zones

5 and 6, realizing of course that these are probably pretty inaccurate, because they were taken from cable tool reports. The 3890 to 4910 would be the Lovington Sand Zone?

Q And the Lovington Sand was never perforated in this log, in this well, for which you have the logs?

A Yes, sir, it is perforated.

Q Which zone of perforation is that?

A Well, sir, I don't have the perforations marked.

Q Oh, these little black indications aren't the perforations?

A No, those are the core analyses.

Q Oh, I thought they were the perforations.

A I have them marked on here, but they do approximate the same zones that were perforated, of course, but also the Lovington Sand is perforated.

Q Now, on your Exhibit No. 4A, Mr. Porter, on these casing programs, I'll take the number one at the top of the exhibit there. There's 12½-inch pipe at 56 feet and 7-inch pipe at 3661 and the 528 sacks relates to the cement that was used on the long string, is that correct?

A Yes, sir, that's right.

Q And in these first four wells, it was circulated to the surface?

A Yes, sir.

Q And all of these wells which have 8 5/8ths inch pipe

set from 700 to 900 or so feet, that surface pipe goes into the salt, is that right?

A Yes, sir. The salt section there has a top of approximately 700 feet and these are all, as you notice, below 700, the shallowest one is 751 feet.

Q And the top of the salt in this area is at 700?

A Yes, sir, that's about where it is.

Q Now, the letters to the State Engineer and to the USGS were written June 4th; I don't suppose you have had time to have a reply from either of those agencies?

A No, sir, I have not received a reply; however, I have talked with both offices and discussed the application with them.

Q I see.

MR. NUTTER: Are there any other questions of Mr. Porter? You may be excused.

(Witness excused.)

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

MR. LOSEE: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in Case 2580?

MR. IRBY: In view of the testimony, Mr. Examiner, we offer no objection to the granting of the application.

MR. NUTTER: Anything further? Take Case 2580 under advisement and call Case 2581.

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

I, MARIANNA MEIER, 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.

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. 2580, heard by me on June 7, 1962.

, Examiner
New Mexico Oil Conservation Commission