

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 11, 1962

EXAMINER HEARING

IN THE MATTER OF:

Application of Cities Service Petroleum Company for conversion of two wells in the Drickey-Queen Sand Unit, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval of the conversion of the Drickey-Queen Sand Unit Wells Nos. 7-1 and 21-3 located, respectively, in the NW/4 NW/4 of Section 1 and the SE/4 NE/4 of Section 2, all in Township 14 South, Range 31 East, Chaves County, New Mexico, to water injection wells. Said wells have not received a response from the waterflood operations.

CASE 2525

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF PROCEEDINGS

MR. NUTTER: The hearing will come to order, please.

We will call next Case 2525.

MR. MORRIS: Case 2525: Application of Cities Service
Petroleum Company for conversion of two wells in the Drickey-
Queen Sand Unit, Chaves County, New Mexico.

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

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, Santa Fe, representing the Applicant. We have one witness, who was

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sworn in the preceding case.

MR. NUTTER: The record will show that he was shown in this case, too.

E. F. MOTTER

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Will you state your name, please?

A E. F. Motter.

Q Are you the same Mr. Motter who testified in Case 2524?

A Yes.

Q Are you familiar with the application of Cities Service in Case 2525?

A Yes, I am.

Q Would you state briefly what Cities Service proposes in this case?

A Yes. If you'll refer to Exhibit No. 1, which is labeled down here "Net Pay Map, Drickey-Queen Sand Unit." In the Southeast Northeast of Section 2, 14 South, 31 East, is what we call Tract 21, Well No. 3; and then a diagonal northeast of that is Tract 7 Well No. 1.

We are asking that those two wells be put on water injection. This does not comply with Rules as provided in 701-E. We have some definite reasons for this that we'll go into later.

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Q Neither one of these wells have received a response from the waterflood, is that correct?

A No, they have not. However, about three days ago I received information that the west offset to 21-3, which is a Holly well, has received response, so actually the 21-3 could come in under Rule 701-E. However, the same situation will exist up there in Tract 7, Well No. 1, eventually; and we would like to resolve both of those problems at the same time.

Q Referring to Exhibit No. 2, would you discuss the information on that exhibit?

A I would like to more or less discuss all four exhibits together, if you don't mind.

Q Why don't you go ahead and do that?

A Exhibit No. 1 is the net pay map based on log and core interpretation. The Caprock-Queen Pool is very difficult to obtain good information from cores and logs, mainly because there were not many logs run; and what few wells were cored, the sand was so poorly cemented it was hard to obtain full cores, and also the scratch completion method is used up there. Many operators just drilled into the sand and that was where the well still remained.

So I might draw your attention to a few spots on this Exhibit No. 1, although we have quite a few contours on it, if you'll note on particular wells there will be 5-L or 7-L, that means that there's five feet we can pick from a log, or perhaps there's 6-C, that means we can pick six feet of net pay from a



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core, but still there are many, many places in here that we have what we would consider not valid information to prepare a reliable net pay map, based on log and core interpretation.

Well, all the work we have done on this field, we feel that performance of the wells has indicated to us at least perhaps some method of determining the amount of pay, and I don't know whether this is consequential or not, but where we have had data, we found that the ultimate primary of a well usually responds to about 10,000 barrels per foot of net pay. This is an iso-ultimate map that we have prepared. In each well the ultimate primary was estimated from decline curves and placed on this map.

From this map we merely go to Exhibit No. 3, divide all these figures by 10,000 and come up with this isopach here, what we will call the net pay map, based on one foot equals 10,000 barrels of recovery.

From these two maps we go to No. 4, which is a composite of No. 1 and No. 3. We feel that this is probably as reliable, as close as we can get. We've actually tried to work in another map into this group, and that is a map based on potentials. As I said previously, the scratch completions up there doesn't lend itself too well, some of the wells are fracked, some of them are natural, too. Maybe a well that we know had two foot of pay was fracked, was potentialized for a couple of hundred barrels and only had six foot of pay produced; natural may have produced a likewise amount of oil on potential.



We didn't feel that this was reliable information, but the Exhibit No. 4 is just about as good as we can determine on a net feet of pay in this particular unit.

Operating under Rule 701 it is necessary that a well has received response or offset response prior to the time that you can convert another injection well. In the South, Southeast of the Northwest Quarter of Section 2, there's an injection well; and also in the Northwest of the Southeast, Section 2 is an injection well which offsets this little shaded area, which is the Whaley tract. Those wells have been on injection forty days. 2 has been on injection since August 29, 1961, the other well to the south has been on injection since November 6, 1961.

MR. NUTTER: Which well was the other one to the south?

A Tract No. 9, Well No. 2.

MR. NUTTER: What was the date of injection there?

A November 6, 1961.

MR. NUTTER: Thank you.

A To March 1st, we had injected 72,951 barrels of water into 40-2. Prior to converting that well, it had produced 83,592 barrels of oil. Normally we get response at offset wells that have experienced this in other parts of the field; when we have injected approximately 60 percent of the void space or filled up that much of the void space of that particular injection well, we begin to notice response of the offset wells.

Bringing this down to a time basis, this usually runs

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between three and four months. The formation volume factor in this field is rather low, so I think you can see the formation volume is probably 1.1. We probably voided 1,000 and put in close to 73,000, so you see we should have received a response at the Whaley Well. Down to the south of the Whaley Well in Tract 29-2, in this four or five months' period we have injected 11,215 barrels of water, and that well had produced a total of 7,921 barrels of oil prior to conversion, which again means we've probably more than filled up the voidage there, and we should have gotten response.

We feel that when response occurs, for instance, let's take the shaded well, the Whaley Well, and then we would be eligible to put the east offset on, 21-3. Going down to 29-2, which according to our net pay map looks like it may have a half a foot of pay, that particular well only takes about 75 barrels of water a day, a thousand pounds of pressure. We feel that when we move up to 21-3, although we show no net pay, this well actually has sand, it's below the water table but we feel that if we put water in there it will still be beneficial. We further feel that we may not get but 25 to 50 barrels of water a day in there, and likewise for 7-1. We have run some calculations out on 7-1, and if we get 50 barrels of water a day in that well, it will take us fifteen months to get complete fillup before we can get response over probably at 35-1. This is based mostly because of the well to the north of it, which is a Great Western Well, that's labeled there



36-13, has been a pretty good well and we feel most of the water will probably go in that direction.

That means that the oil bank will have reached 35-1 in fifteen months; however, producing that back, it probably will be ten months before we get any response whatsoever. In that period of time an injection well over there, what we call Tract 32-1, which will be the west offset to the 35-1, will have pushed the oil back to 35-1, and we have estimated we might lose as much as close to 10,000 barrels of oil, or we expect 35-1 to recover in the neighborhood of 45,000 barrels; and we estimate we may lose as much as fifteen percent of that, which will be pushed out in cusps probably between various injection wells due to an unbalanced condition.

That, basically, is our reasoning for wanting those two wells put on injection at this time.

Q And the primary reason for seeking this is the time element involved in achieving a response from these particular wells, is that correct?

A Yes, that's right, and more especially since we don't feel we are going to get too much water in, which has been demonstrated by 29-2.

Q Was there attached to your application a schematic diagram showing the completion of the proposed injection wells?

A Yes. That's, the completion will be in the same method as all of our injection wells in this particular area.

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Q Were Exhibits 1 through 4 prepared by you or under your supervision?

A Yes, they were. I might add, I had copies of all the logs in this particular area duplicated. I'm sorry that they are not more legible. If the Commission would desire, I will be glad to make those a part of the record.

MR. NUTTER: I don't think they'll be necessary. We have quite a few logs of the area in your original unit file.

MR. KELLAHIN: We would like to offer in evidence Exhibits 1 through 4.

MR. NUTTER: Cities Service Exhibits 1 through 4 will be admitted in evidence.

MR. KELLAHIN: That's all the questions I have.

MR. NUTTER: Any questions of Mr. Motter?

MR. MORRIS: Yes.

CROSS EXAMINATION

BY MR. MORRIS:

Q What was the significance, Mr. Motter, of the shading down here in Section 22?

A Well, in Section 22 is the same situation we have in Section 2. Those are what we call "windows" in this unit, people that have not joined the unit. I might add for your information that the window in Section 2, we're working out a side agreement with the Whaley people whereby we will go ahead and flood as if they were in the unit. I might add that hasn't been signed, but



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we're hoping it will be signed soon. The tract to the south is currently under negotiation. That's an O'Neill tract and we are currently negotiating to get them in the unit.

Q You are not asking us to take any action down here in Section 22?

A No, that's correct.

Q Would you propose to inject water in this well in Section 2 before you had an agreement with the owners of the Southwest of the Northeast?

A Yes, we propose to go ahead and inject water there. We feel, frankly, as you'll see from the map, there's not much to gain in the amount of oil that may be recovered there, although we are currently trying to negotiate a financial settlement with Mr. Whaley. We've reached an agreement with him that we will go ahead and put this well on; verbally, he has offered no objection. I don't know if he has written the Commission to that effect or not. We would like to go ahead and proceed, we have got other people to think about up here, Great Western is moving in from the north quite rapidly and we are trying to get up there to offset them when the time comes.

MR. MORRIS: I might address a question to Mr. Kellahin. I have some qualms about approving an injection program on a tract that hasn't been committed to the unit.

MR. KELLAHIN: The injection, of course, will not be on the tract. The effect would be on the tract -- and could I



ask Mr. Motter a question?

MR. MORRIS: Yes.

MR. KELLAHIN: Do you know the current status of production from the Whaley Well?

A Yes. I have the file with me, and that well last year averaged about 25 barrels a month; in the month of March it made 33 barrels of oil, total.

MR. NUTTER: March of 1962?

A Yes. Maybe the Attorney for the Commission is confused. The injection well will be 21-3. The Whaley tract will be a producer.

MR. MORRIS: I see. I was confused.

MR. KELLAHIN: It will be produced and receive the benefit of the water injection. That's the approach they are taking in negotiating the agreement with him at this time.

MR. NUTTER: Off the record.

(Whereupon, a discussion off the record was held.)

A I didn't make it clear, but all of our proposed injection wells are circled there; and, of course, his well is not.

MR. MORRIS: I have no further questions.

BY MR. NUTTER:

Q Mr. Motter, did I understand you to say that you expected the 35-1 to eventually produce 45,000 barrels of oil?

A Yes. We think that there's that much oil, probably most of it will come from Tract 32, which is right west of 35; it

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will be swept into 35.

Q On your iso-ultimate map, it only shows 3,000 barrels?

A That's right, but if you'll refer to Tract 32-1, that well has produced 50,000 barrels.

Q What is the iso-ultimate map; is this drawn --

A This is the ultimate primary.

Q This is the ultimate primary only?

A Yes.

Q So the ultimate ultimate is not shown here?

A No, the secondary ultimate.

Q Has the 21-3 ever produced any oil?

A Let me check my figures. It may have swabbed just a little bit. May we go off the record a minute?

(Whereupon, a discussion off the record was held.)

MR. NUTTER: On the record.

Q (By Mr. Nutter) Repeat the last statement, how much oil has the No. 21-3 made?

A To the best of our knowledge, we cannot prove it has made any oil over the load oil that was recovered. For purposes of unitization so that this well could get credit in the unit and be used as an injection well, the Engineering Committee agreed to give it 300 barrels primary.

Q So it has been assigned 300 barrels on the iso-ultimate primary?

A Right.



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Q How about the No. 7-1?

A The No. 7-1 potentialized for 22 barrels of oil, and its production was 4556 barrels.

Q And you show 5,000 on your ultimate, iso-ultimate?

A Yes. I might add this, also, on iso-ultimate. This is to an economic limit of 2.7 barrels a day. That is the reason -- the Whaley Well has actually produced more than shown on the map, but we felt it was all beyond the economic limit; therefore we couldn't credit it with any more than we could credit the other wells.

Q Do you anticipate any injection difficulties as far as the 21-3 is concerned?

A We may have difficulties with both 21-3 and 7-1, and that's something that the only thing we can do is go to try to put water in them. If we run into extremely high pressures, we have another alternate plan to try to get what water in we can, but if you'll refer back to, I believe it's Exhibit No. 1, in the Northwest of the Northeast of Section 2 there's a dry hole in the center of that 40; since the 330 location northwest of that is a real good well, this dry hole is still cased and we have been thinking seriously about perhaps re-entry into there for an injection well. Of course, we will seek your approval of that prior to the time of doing it. If these two wells do not take water as we think they should, that will be probably an alternate.

Q Evidently the 7-1 must have encountered a tight sand,



because you didn't expect to get more than 20 to 50 barrels of water in it?

A We think it was not only tight but it was completed below the water table.

Q Do you expect the sand in No. 21-3 is tight?

A Yes. Actually, comparing it to 29-2 where we know it has one foot of pay from the log, we think that it may be similar to that, or perhaps even lower.

Q What kind of pressure is necessary to get the 11,225 into the 29-2?

A We have been putting in, in the month of March, 7300 barrels a day at 750 pounds. The instructions are to operate that well at no higher than a thousand pounds surface pressure. At that pressure, we are only able to get 80 barrels a day in, but 1,000 pounds happens to be the pressure to put it in all the rest of the wells, so that's all we have available for this well.

Q At the expected 50 barrels per day into the 7-1, it would take approximately 15 months for the oil bank to move from the 7-1 over to the 35?

A That's right, 15 months to move the bank. We expect some response in probably ten months, but in the meantime, well, this injection well in Tract 32 will have been pushing oil to the east continuously, which we feel that we could lose between some of those injection wells.

MR. NUTTER: Are there any further questions of Mr.

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Motter? He may be excused.

(Witness excused.)

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

MR. KELLAHIN: No, sir, that's all.

MR. NUTTER: Does anyone have anything to say in this case? We'll take the case under advisement.

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss

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, and that the same is a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

DATED this 17th day of April, 1962, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

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. 2525 heard by me on 4/11, 1962.

[Signature], Examiner
New Mexico Oil Conservation Commission

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