BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 3, 1961

IN THE MATTER OF:

Application of Great Western Drilling Company for a water injection-oil producing dual completion and for an exception to Rule 107 (d). Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its Federal MM Well No. 1, located in the NW/4 NE/4 of Section 8, Township 9 South, Range 37 East, Lea County, New Mexico, in such a manner as to permit the injection of water into an interval from 4300 feet to 9400 feet and the production of oil from an undesignated Pennsylvanian pool. Applicant further seeks an exception to Rule 107 (d) to permit the setting of tubing in said well more than 250 feet above the top of the pay section.

Case 2208

BEFORE:

Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: Hearing will come to order, please. First case this afternoon, Case 2208.

MR. MORRIS: Application of Great Western Drilling Company for a water injection-oil producing dual completion and for an exception to Rule 107 (d).

MR. CRISTY: Sim Cristy, Hervey, Dow & Hinkle, for the applicant, Great Western Drilling Company. We have one witness, Mr. Examiner.

(Witness sworn.)

JOHN HAMPTON

called as a witness, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. CRISTY:

Q Would you please state your name, address and occupation?

A John Hampton, Great Western Drilling Company, Chief Production Engineer, Midland, Texas.

Q Mr. Hampton, have you previously testified before this Commission and had your qualifications accepted as a petroleum engineer and geologist?

A Yes, sir, I have.

Q Are you familiar with the matters contained in this application, Case 2208, before the New Mexico Oil Conservation Commission and what the application seeks?

A Yes, sir.

Q Are you familiar with the well in question in the application and its production history?

A Yes, I am.

Q And the area in question?

A Yes, sir.

Q Would you please briefly tell us what is sought by the application?

A The application seeks to obtain permission to dually complete the Great Western Drill Company Federal MM No. 1 Well, lo-

cated in Section 8, Township 9 South, Range 37 East, Lea County, New Mexico, as an oil producer from the Bough "C" zone and as a water disposal well.

Q Is that salt water?

A Yes.

Q Now, sir, I will refer you to what has been marked Exhibit 1, which I believe is a plat map of the area, and ask if you will identify this instrument and give us any pertinent data from it, please?

A This is a plat of the area showing several miles around the lease. You will notice the well is located in the N/2 of Section 8. The lease is outlined in yellow. The well, I believe, is 660 from the North line and 1980 from the East line of Section 8.

Q This shows us the offset operators?

A It shows the offset operators and, I believe, all of the producing and dry holes in the area.

Q You said the well under question is producing from the Bough "C" formation. Is there any other well in the area producing from that formation?

A Not within about a two-mile radius. I believe the wells in the Allison and North Allison produce from the Bough "C".

Q With respect to this Bough "C" production, what depth is that, sir?

A The perforations in this well are just 9661 to 66, and 9670 to 76.

MR. CRISTY: I might state to the Examiner, that is about a one foot difference than that shown in the application. I apparently misunderstood.

Q Do you have a schematic diagram as to the method you propose to dually complete this well as you have mentioned?

A Yes, sir.

Q That is Exhibit 2?

A Exhibit 2 is a schematic diagram of our proposed completion of this well. I might briefly explain what that diagram shows. It shows we set 10 3/4-inch casing at 422 feet and cemented it with 350 sacks of cement. The cement circulated to the surface. It also shows that we have set 7 5/8-inch casing at 4291, and cemented it with 1,000 sacks of cement. The top of the cement is at approximately 1700 feet. We set 4 1/2-inch casing at 9731 and cemented it with approximately 100 sacks of cement, and the top of the cement is at 9400 feet.

Q Would you mention the casing program on that well, sir, as depicted in Exhibit 2?

A Yes, sir.

Q You did? I beg your pardon. What does the red arrow depict on Exhibit 2?

A The red arrow depicts the way we propose to inject salt water into this well, and the arrow indicates the approximate flow of the water which, I believe, would enter the San Andres porosity, the top of it, at approximately 4870 feet.

Q Through an open hole at that point?

A Yes, sir. It would be at that point.

Q As the salt water is returned to that San Andres formation do I understand it passes down through your intermediate string of casing?

A It passes through the annulus space between the intermediate casing and production string of casing.

Q I also notice the tubing is set approximately 4500 feet?

A That's correct.

Q Why is the tubing set there when production is at 9660?

A For efficient production operations. We cannot pump all of the fluid level below this depth of 4500 feet, so we can get all of the production we can pump out of this well with the tubing set in here.

Q In effect, you are probably somewhat skimming the oil from the top of the column?

A Yes.

Q This is not a flowing well, is it?

A No, sir, it is not.

Q Has it ever been?

A No, sir.

Q I gather the tubing, then, was set for the skimming purposes as a matter of economics?

A That's correct. It would be extremely difficult to pump the well from 9450 feet or so.

Q In drilling the well, did you encounter any oil or gas shows that would appear to be in paying quantities in these other formations where you propose to inject the salt water, from the San Andres down through the Wolfcamp?

A No, sir. The only shows or indications of oil or gas production we saw in drilling this well was from the Bough "C" zone.

Q Do you have a log on this well?

A Yes, I do have.

Q That is marked as Exhibit 3, I believe?

A Yes, sir.

Q Now, sir, is the area in which this well is located, is that in any declared underground water basin?

A No, sir, it is not.

Q Is it in any of the critical area as declared by the Commission in respect to disposing of salt water?

A To the best of my knowledge the Commission has not called this a critical area.

Q Did you encounter any formations in drilling the well which were productive of fresh water?

A I cannot really state definitely whether there is any water production in this area or not. However, I believe if there were any the bottom would be at about 220 feet, and I might point out here, again, we did set 422 feet of surface casing, and cemented circulated to the surface, so I believe any fresh water zones would be adequately protected.

Q How about the Santa Rosa formation; did you encounter that?

A Yes, I believe the top of it is approximately 580 feet.

Q That is depicted on the log, Exhibit 3?

A Yes. We marked the top of the Santa Rosa at 580 feet on this log. The Santa Rosa here on this log looks shaly and tight to me, impermeable, and I doubt if it would produce any water.

Q There were no indications of water that should be protected from that formation?

A No, sir. This log has the tops of the various formations marked on it. It has the casing marked on it, and also at the bottom it has the perforations marked on it.

Q This water you are producing out of the Bough "C" that you propose to re-inject, is that salt or fresh water, sir?

A It is salt water.

Q Have you had a water analysis run on that?

A Yes, sir, we did have.

Q I believe that is marked as applicant's Exhibit 4?

A Yes, sir. Halliburton ran an analysis of this water from the water we recovered on a drill stem test, and this is indicated in our Exhibit No. 4, their analysis of this water.

Q Does that analysis reflect to your mind that it is water suitable for domestic, stock, irrigation, and or general use?

A No, sir, it would not be.

Q Why?

A I believe the salt content would be too high for domestic

or any other type use.

Q Does the exhibit reflect any corrosive qualities of the water?

A Well, we would have to admit that any salt water is corrosive to a certain degreee. I believe, though, that this salt water would be considered only mildly corrosive.

Q What would be your main solid constituents, sodium and chlorides?

A That's correct, and you would expect them to be in the form of sodium chloride or salt in the water. We might point out here, sulfides are negligible, and we do plan, if granted this permission, we will have a closed system here which would prevent oxygen from entering the system and, consequently, would cut down on any corrosive tendensies these waters might have.

Q For the interval inthe Santa Rosa formation you would have the casing also to protect it?

A That's correct.

Q Is there much chance of that salt water eating through the casing, Mr. Hampton?

A In my opinion there is not much chance of it. However, we would take one precaution here, by installing a flow line or a valve on our surface casing. You can see there if the casing which is not protected by cement here were to corrode, we would get an immediate indication on the surface, if we had some device such as a flow line or a valve on our surface casing.

Q You do propose to use such a safety precaution?

A Yes, sir, we do.

Q About how much salt water do you propose to inject?

A It is extremely difficult to put an exact figure on it. This is a new well. In fact, we don't even know if it is a commercial well. We have been pumping this well for some few days now, and I believe that the maximum we would anticipate would be about 350 barrels a day. The water content of the production is quite high. The oil content is low, and like I say, we actually do not know if this is a commercial well. A period of testing this well should indicate to us whether it is a commercial well or not, and, of course, we do have more acreage in this area, and if the well turns out to be commercial we would, of course, drill additional wells in this area. If we do drill an additional well here we would recirculate the cement behind the intermediate casing and more suitably equip that well for injection purposes than this one is now.

Q Would you dispose of the salt water from this well into such other well or wells?

A Yes. In fact, we envision, if we do develop this area, that the most proper thing to do would be to return the produced water to the producing formation, which we would probably consider doing if we do drill additional wells.

Q So the situation here presented today is a one well situation?

A That's correct. That is the one well we have in that area.

Q Mr. Hampton, do you have the Commission's form to dispose of salt water?

A Yes, sir.

Q Do you have that filled out?

A Yes, sir.

Q Has that been marked as Exhibit 5?

A Yes, sir.

Q Is there anything pertinent on that exhibit which has not been covered?

A Not really, except I might point out here that in answer to one of the questions on this form we say we estimate the pressure will be at a thousand pounds. That is what we would estimate the maximum that we would ever inject water into this formation under. I believe initially it will probably go at little or no pressure into the disposal system. Other than that, I believe that is about all pertinent about this.

Q It does reflect the offset operators and surface operators?

A Yes, sir.

Q What kind of a lease is that, fee, State, or Federal?

A Federal.

Q Have you prepared the Commission's application form for dual completion, also?

A Yes, sir, I have.

Q Marked as Commission's Exhibit 6?

A Right.

Q Is there anything particularly on this form we have not covered?

A I believe we have covered this form.

MR. CRISTY: Mr. Examiner, in connection with the offset operators, as Exhibit 7 we have an affidavit of mailing to all those offset operators and the surface owners, State Engineer and U.S.G.S. I have the registered return receipts if you would prefer them.

MR. NUTTER: This is suitable.

Q Mr. Hampton, do you feel the granting of this application would be in the interests of conservation?

A Yes, sir, I do.

Q Would it tend to prevent waste?

A Yes, sir, it would.

Q Could the correlative rights of interested parties be violated by the granting of the application?

A No, sir.

Q Is there anything I have failed to ask you that you feel might be of interest to the Examiner?

A Not that I can think of.

Q In connection with the consideration of the application, we might just point out here we would prefer to dispose of this water into the San Andres, or to this open hole interval, in order to make a permanent type disposal of the water instead of putting in surface

pits or trying to haul it or something else where you still have the problem of the salt water not being disposed of.

What else could you do with the salt water; could you truck it out as a matter of economics?

A It could be trucked, but not economically. I don't even know where you would put it if you trucked it.

Q Is there anything else?

A I believe that is all.

MR. CRISTY: Mr. Examiner, our application includes the exception to Rule 107 (d). I would call the Commission's attention to memorandum 21-58, classification Order R-1173, dated August 8, 1958, which seems to indicate to me that Rule 107 (d) applies only to flowing wells, and I believe the witness has testified this is, in fact, a pumping well, but we put it in the application to be certain.

MR. PAYNE: That is correct, Mr. Cristy.

MR. NUTTER: Any questions of Mr. Hampton?

BY MR. PAYNE:

Q You said this is a new well. Did you use new casing?

A Yes, sir.

Q And you feel that at first, at least, you won't have to inject under pressure; it will be gravity flow?

A I don't believe we will.

Q If you do drill additional wells, then you propose to abandon this disposal well?

A The disposal part of it, yes, sir.

Q Did Great Western consider the feasibility of installing tubing to inject through rather than injecting through the annulus?

A We considered it, but it didn't seem feasible.

Q If you got a casing leak, as I understand it the water you are disposing of is produced from the same well?

A Yes, sir.

Q If you got a casing leak, how would you know? Wouldn't the water just come right back up like it does now?

A If you had a casing leak into the production string of casing, yes, sir, it would.

Q There is no possibility of drowning out any other zones?

A I don't believe that any of the zones in this open hole interval are productive in this area of oil, gas or fresh water.

Q What is the maximum pressure you ever anticipate having to inject?

A A thousand pounds. I doubt very seriously if we would reach that pressure, but there is a possibility we would.

Q Is 60,000 parts per million chloride considered rather high?

A No, sir, I wouldn't say high. It is considered salty water, but I don't believe it is a high concentration of salt.

BY MR. NUTTER:

Q Mr. Hampton, it is your opinion that the water is going to go into this porosity in the San Andres, is that right?

A Yes, sir.

Q And the top of the cement on the Bough "C" is at 9400?

A Yes, sir.

Q If you got a column of water standing on the top of that cement, in order to have any water available to the porosity in the San Andres, what would the hydrostatic head be on the top of the cement there? You would have a column of water about --

A 9400 feet.

Q It would be considerable pressure on it?

A Yes, sir.

Q On the top of the cement?

A Yes, sir, there would be considerable pressure.

Q How much cement do you have from the uppermost perforation in the Bough "C", approximately 200 feet?

A I believe that's right, yes, sir.

Q Were centralizers used on that 4 1/2-inch pipe when it was set?

A Yes, sir, they were.

Q Are you familiar with any application of this type which has been approved by the Oil Conservation Commission?

A Not of this type, no, sir, I am not.

Q Are you familiar with any instances where, in other states, this type of installation has been approved and it resulted in the watering out some producing formations?

A No, sir.

Q Has Great Western made any effort to dispose of this produced salt water in the well which was drilled and abandoned in the SW/4 of Section 9?

Aq We have not made an effort, no, sir. It think it would be economically unfeasible to try it.

Q That well was T.D.'d at approximately 2508; would that have penetrated the San Andres porosity?

A Yes, sir, it would have.

Q Have you observed the log on that well by any chance?

A No, sir, I have not.

Q How much oil is that well producing?

A When we can pump it 24-hours a day and keep pumping it all the time it makes between 60 and a hundred barrels of oil a day.

Q How much water does it produce at this present time?

A I can tell you how much water it has produced on different occasions. We have produced a hundred barrels -- at one time we produced a hundred barrels of oil and a hundred barrels of water. We have produced as little as 50 barrels of oil and 300 barrels of water.

Q It has gone to a ratio of 6 to one on water on occasion?

A On occasion we have pumped 98% water out of it. That is the reason I say we do not know if it is a commercial well.

Q What is the thickness of the Bough "C" in this area?

A Not very thick.

Q You have a total of 15 feet of gross perforated interval,

is that correct?

A That's correct. It looks to me like the Bough "C" is approximately 30 feet thick. It is my understanding that is the production history of Bough "C", that it is quite often, when you initially complete a well there is quite a bit of associated water production with it, and that after some of the water is pumped off you do improve in oil production, but that is something only time will tell us.

Q Is there any possibility of running a 1-inch pipe or small diameter pipe down the annulus of the 4 1/2 and with the 7 5/8 and cementing the well below the porosity in the San Andres?

A Below the porosity in the San Andres?

Q Approximately at the interval I have marked with red pencil on this exhibit?

A That would be a possibility, I believe, Mr. Nutter. I couldn't answer for sure.

Q There would also be the possibiity of perforating the 4 1/2 and squeezing that interval in there, wouldn't there?

A There is thatpossibility, yes, sir.

Q Do you agree some sort of cement job, regardless of how it was performed, that would give a layer of cement in this area, would afford additinnal protection to the Bough "C" from being watered out?

A If you could get an effective cement job.

Q It would afford additional protection if it were needed?

A It is my opinion it is not needed.

Q If that work was performed you wouldn't have 9400 feet of water standing on top of the Bough "C"?

A Not if you could get an effective cement job.

BY MR. PAYNE:

Q Is there any water flood project in this area?

A Not to my knowledge.

Q Is the Allison-Pennsylvanian Pool approaching the time when it will probably be water flooded?

A I don't know, sir.

Q In any event, there is no water flood project at pesent where you could use this water?

A Not to my knowledge there is not.

BY MR. NUTTER:

Q What are you doing with the water at the present time?

A Surface pits.

BY MR. PAYNE:

Q Unlined?

A Unlined.

MR. NUTTER: Any further questions of Mr. Hampton? He may be excused.

MR. CRISTY: For the record, Mr. Examiner, at the time this application was originally made it was made in the form of an application for administrative approval, at which time, I believe the State Engineer wrote the Commission a letter expressing some

concern in connection with the application. I believe Mr. Irby has been here today, and perhaps a conversation with him yesterday may have been of some benefit to any problems the State Engineer might have.

MR. PAYNE: Mr. Irby, did you want us to read your report into the record?

MR. IRBY: I think it is a matter of record.

MR. PAYNE: We can read it into the record, or just put it in the case file. Is this still the State Engineer's position?

MR. IRBY: Yes, sir.

MR. NUTTER: Anything further, Mr. Cristy?

MR. CRISTY: May I offer in evidence applicant's Exhibits 1 through 7 inclusive?

MR. NUTTER: Great Western's 1 through 7 will be admitted. Anyone have anything further? Take the case under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, JUNE PAIGE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 10th day of March, 1961.

June Paige
Notary Public - Court Reporter

My Commission expires:

May 11, 1964.

I N D E X

E X H I B I T S

NUMBER	EXHIBIT	IDENTIFIED	OFFERED	ADMITTED
Ex.#1	Plat Map	3	18	18
Ex.#2	Schematic Diagram	4	18	18
Ex.#3	Log	7	18	18
Ex.#4	Water analysis	8	18	18
Ex.#5	Salt Water disp. form	10	18	18
Ex.#6	Dual Completion form	11	18	18
Ex.#7	Affidavits of mailing	11	18	18

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2208, heard by me on 9/13, 1961.

....., Examiner
New Mexico Oil Conservation Commission