BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 28, 1959

EXAMINER HEARING

IN THE MATTER OF:

Application of Graridge Corporation for a dual injection-producing well. Applicant, in the above-styled cause, seeks permission to dually complete its Western-Yates State Well No. 14, located in the SW/4 NE/4 of Section 28, Township 18 South, Range 28 East, Eddy County, New Mexico, in such a manner as to permit the injection of water into the "first" zone of the Grayburg formation in the Artesia Pool through the casing-tubing annulus and the production of oil from the "Lovington" zone in the Artesia Pool through tubing. Case 1797

BEFORE:
Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. PAYNE: Application of Graridge Corporation for a dual injection-producing well.

MR. CAMPBELL: John M. Campbell, Campbell and Russell, Roswell, New Mexico, appearing on behalf of the Applicant. I have one witness, Mr. Ford.

MR. PAYNE: Let the record show that Mr. Ford was sworn in the previous case.

TOM FORD

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

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q State your name, please. A I am Tom Ford.

Q You are the same Tom Ford who testified in Case 1796?

A I am.

Q Mr. Ford, are you acquainted with the application of Graridge Corporation for a dual water injection oil producing well in the Artesia Pool in Eddy County, New Mexico?

A I am.

Q Are you acquainted with the general, with the application that was filed with the Commission for this particular well?

A I am.

Q Was there attached to that a diagramatic sketch of the dual completion?

A Yes, sir.

Q Was there attached a plat showing the location of the wells on the lease and offset leases?

A Yes.

Q And electric log showing the tops and bottoms of formations concerned insofar as this well is concerned?

A Yes, sir.

(Marked Graridge's Exhibit No. 1, for identification.)

Q Mr. Ford, I refer you to what has been marked as Exhibit

No. 1 in this case and ask you to state what that is.

A This is a map of a portion of the Artesia Field in Eddy County, New Mexico, specifically Section 28, Township 18 South, Range 28 East is featured marked with a red square as the No. 14 State Well.

Q Now, Mr. Ford, are you acquainted with the owner of the acreage underlying that well and the ownership of the well itself?

A I am.

Q Will you state to the Examiner what the situation is with regard to that ownership, please?

A This property was owned several years ago by the Resler Oil Company and the Yates Brothers of Artesia. At the time we purchased the first Grayburg Zone from them with the intent of water flooding it. So specifically the Northeast Quarter of Section 28, we own the first Grayburg Zone, Resler, Yates, Resler Oil Company and the Yates Brothers retained all other producing horizons. Later Resler Oil Company sold their interest to the Western Development Company of, a Delaware Corporation I believe they are. So now, Western Development Company and the Yates Brothers own all zones except the first Grayburg Zone which we are water flooding in the area.

Q What problem did that present with regard to this particular well, Mr. Ford?

A They retained this well, they retained several wells in

here, but this well specifically was retained by the Resler-Yates interest which later became the Western-Yates interest, and it is producing from the Lovington pay at some 24, 2500 feet. We are interested in the pay in the first Grayburg pay, as I mentioned previously.

Q Are those two pays separated, separate pays?

A Yes, they are.

Q Geologically, I'm speaking.

A Geologically they are separate pays.

Q So then it was necessary for you to try to work out some sort of an arrangement where you could flood the first Grayburg zone without affecting the Lovington pay, isn't that correct?

A That is correct. We were specifically required by the contract of sale to protect their zones in any wells that they retained.

(Marked Graridge's Exhibit No. 2, for identification.)

Q I hand you what has been identified as Exhibit No. 2 in this case and ask you to state what that is, what the diagramatic sketch is.

A This is a diagramatic sketch of this well we're talking about, the Western-Yates State No. 14.

Q This is its present status?

A This is its present status. The well was drilled some thirty-five years ago and it has changed ownership several times. Its history is somewhat vague so we went in and logged the well and gamma ray log and also a caliper log, trying to find out its present status. This sketch shows the best we know of its present status.

Q What does it show?

A It shows that it was originally drilled at a twelve quarter hole to about 260 feet and ten and three-quarter casing was set there. Whether that casing is still there or not we have no way of knowing. Next they drilled a ten inch hole to a thousand and ten feet and set eight and five-eighths casing. We assume it is not cemented, we have no way to know except that most of the wells, when these wells were being drilled, most of them were not cemented.

Drilled an eight inch hole on down and this is a presumption, but presumably they completed in this first Grayburg zone and shot it with nitroglycerin. At some later date they went in and drilled a well on down to the Lovington pay and shot it with nitroglycerin. Apparently there was a considerable caving in the Lovington zone, or possibly from the first Grayburg down to the Lovington, so they set a liner in there to restrain caving, a perforated liner. As best we can tell from the records, that reflects the situation of the well right at this time.

(Marked Graridge's Exhibit No. 3, for identification.)

Q I refer you to what has been identified as Exhibit No. 3 in this case and ask you to state what that is, please.

A This is a diagramatic sketch showing the proposed dual completion installation. In this installation we would propose to allow Western-Yates to produce oil from their Lovington pay zone and to allow us to inject water between the tubing and casing in the annulus between the tubing and casing into the first Grayburg pay.

I would mention that the original sketch that came in with the application was incorrect as to the zone to be perforated in the first Grayburg. The gamma ray kind of went crazy in that zone and we had to interpret that between several surrounding wells.

Q What is the change from the application attachment to the Exhibit No. 3, please?

A I believe you have that application. I don't have a copy of that.

Q The attachment shows the perforation in the first Grayburg to be 2,045 to 2,070?

A That is correct. This new sketch which is corrected is 2,012 to 2,052. We drilled a nearby well and were able to interpret that better.

Q Will you explain to the Examiner what you propose to do with this well under an agreement with the present owners of the well and those who are producing from the Lovington pay?

A Referring back to Exhibit 2, we would propose to go in and remove the seven inch liner completely. This may be impossible, but if it is possible we would remove this liner completely, clean out the well completely, set five and a half inch casing to a depth of 2500 feet and cement it probably to the surface. We would then go in and perforate the Lovington formation, Western-Yates would do this, it being their pay. They would frack it as necessary and complete it as a suitable producer.

We would then set a Model D Baker packer at 2350 feet and put a temporary plug in it, and we would complete our first Grayburg zone by perforations from 2,012 to 52 and test it to see if it would take water satisfactorily. If it would, we would remove the plug from the Baker packer, run tubing, and we will inject water down the annulus between the tubing and the casing into the first Grayburg zone. Western-Yates would produce oil from the Lovington through the tubing.

Q And, of course, this would be conditioned upon your ability to move the liner from the well and get the well in condition where this type of installation could be put in the well, is that right?

A That is correct. That would be a condition that

if we got that liner out, then that is what we could do. If we cannot remove the liner, we would remove as much as possible and cement in five and a half inch at least through our first Grayburg zone and be sure that it was shut off and into the seven inch casing and through our zone so we could still make a completion that way. It would have the disadvantage that Western-Yates could not satisfactorily frack their Lovington zone, but we could inject into the Grayburg zone.

Q With regard to that Lovington zone, what is the present producing capacity from that particular pay?

A The well produces two barrels a day. We assume that it is coming from the Lovington zone. It is conceivable from the shape that the well is in now, that part of it could be coming from this upper zone, from the first Grayburg zone.

Q Are the wells completed to that Lovington pay limited in number in the area?

A No. I would say there are at least fifteen or twenty of them in the general area.

Q You had the obligation under purchase contract to protect the Lovington pay zone whenever you go into the area for injection of water?

A That is correct.

Q How would you detect any water leakage in connection with an installation of any type, Mr. Ford?

A The most obvious way would be a drop in pressure, a drop of our injection pressure, we would immediately suspect that we had a packer leakif our water pressure dropped. Another way would be that you would, if we had a leak in the packer or in the tubing you would immediately start producing water and probably considerable amounts of water from this Lovington zone.

Q Do you believe if this well is recompleted in this manner that it will perhaps result in the ultimate recovery of more oil from the Lovington pay than will be recovered from the well in its present condition?

A Yes, very definitely.

Q Suppose you were to drill another water injection well in the vicinity of this well, which you would have the right to do I assume, down to the first Grayburg zone. What risk would be involved from the point of view of waste if you were to do that in lieu of an installation of this sort?

A Water would immediately channel through the first Grayburg zone and wash into this well and up and over the liner and quickly wash all sorts of deposits. It would literally drown the Lovington producing zone in this well.

Q This is due to the nature of the completion of this well and its present status?

A That is correct.

Q Do you believe that if you are permitted to make this

attempt at least at this dual completion that it will result in the prevention of waste?

A I do.

MR. CAMPBELL: I believe that's all I have at this time.

MR. NUTTER: Any questions of Mr. Ford?

MR. PAYNE: Yes, sir.

MR. NUTTER: Mr. Payne.

CROSS EXAMINATION

BY MR. PAYNE:

Q What you call the Lovington zone, Mr. Ford, is now producing on primary, is that right?

A That is correct.

Q What is the producing mechanism in this pool or in each of these zones, if it might be different?

A As best I know, it's a solution gas drive in the Lovington and, of course, in the Grayburg zone it was solution gas drive, but is now water flood.

Q Now, what is your proposed injection rate into this well, and do you propose to inject by pressure or is it gravity flow?

A It will be by pressure. We carry normally about a thousand to twelve hundred pounds in our water flood in that area. I would assume we would use that full pressure, and we would probably, with that pressure, inject something like 250

barrels a day.

Q What would that make the pressure at the packer?

A Roughly a thousand pounds plus the thousand pounds at surface, or twelve hundred pounds at surface, about 2200 pounds per square inch.

Q What is the packer designed to withstand?

A I can answer you that, but I would, they regularly run on up ten thousand feet deep and just almost any pressure.

Q In other words, you feel the packer could withstand the 2200 pounds per square inch?

A With ease. We have run them in similar situations in Texas where we have similar duals as deep as 4,000 feet, so I think there would be no question of the packer.

Q I believe you testified that if you drilled another injection well, the water might go down and could drown out the Lovington zone?

A Correct.

Q Now, even if your installation, the water got down to the Lovington zone by way of the packer or by way of a leak, the same result might be forthcoming, you might drown out the Lovington zone?

A No, I don't believe so for this reason: when I say drown it out, if you can visualize another well sitting over here ten feet, say fifty feet away, obviously, and I'm putting in 250

barrels a day, then if this 250 barrels a day shoots the gap and comes into this well bore, then I'm putting 250 barrels in there a day now. When I say drown it out it wouldn't literally do that if they would install enough equipment to handle all of that 250 barrels a day. I think they would still get their two barrels of oil a day.

Q Are there any fresh waters in the area?

A Again that is something that is very difficult to tell, except on the log they do show that I believe it was 240 to 250 that there was fresh water.

Q Wouldn't it be safer in such a case to inject the water down tubing rather than through the annulus?

A It would present a rather involved completion in that you would have to go to two packers and across over. It could be done but we feel that with two strings of casing already in there, presuming this ten and three-quarter string isn't there, and then putting a third string in there and cementing it to the surface, that we would have excellent control.

Q Now, what leads you to the conclusion that these are separate and isolated zones in the Artesia Pool, this first Grayburg and the Lovington?

A They're about 400 feet apart.

Q Are there any dual producing wells in this pool, one producing from the upper zone and one producing from the lower?

A Not that I know of.

Q So that for proration purposes at least it's treated as one horizon?

A I would think so, yes.

MR. PAYNE: Thank you.

MR. NUTTER: Any further questions of Mr. Ford?

MR. FLINT: Does the Lovington formation make any water at this time? I imagine it's hard to judge from this well, but from surrounding wells do you have any information on that?

A As best I know it does not, it might make a small quantity, but it's negligible.

MR. CAMPBELL: I have a letter here addressed to the Commission I was going to read from the Western Development Company of Delaware that owns the well that might cast some light on the Lovington pay situation there. If I may be permitted to read it at this time and then offer it in evidence, it's addressed to the Oil Conservation Commission, dated and signed by W. B. Macey. "Gentlemen: The above captioned case is to be heard on October 28, 1959, in Santa Fe, New Mexico. This Company and Yates Brothers of Artesia, New Mexico, are the owners and operators of the well in question. At the present time we are pumping this well at the rate of 2 BOPD from the Lovington Sand zone of the San Andres formation in the Artesia Pool. This well is at present on the south side of a water flood project being conducted by the Graridge

Corporation. Our predecessors, Resler Oil Company and Yates Brothers farmed out the rights to the "old field pay zone" currently being flooded by Graridge.

In order to prevent waste it is imperative that this application be approved. As will be explained in the testimony in the case, it is necessary that some remedial work be done on the well insofar as the "old field pay zone" is concerned. This work is necessary in order that the flood in this area will be successful. While the Lovington Sand zone is certainly not an important oil reserve, it obviously will have to be abandoned if the application is not approved, and as a result, any remaining recoverable reserve would be lost.

The danger of any water leakage by way of packer failure and resultant damage to the Lovington Sand reservoir is virtually nil since a leak would be immediately recognizable by (1) decreased injection pressure and (2) the appearance of water in the producing column of the Lovington Sand interval. It is extremely doubtful that water could hurt the Lovington Sand reservoir since we have had considerable success in the area using fresh water as a fluid in fracturing sand wells.

This Company and Yates Brothers have indicated verbal approval of an Operating Agreement with Graridge for the joint operation of this well. The Commission's approval of this application will result in a greater recovery of oil from both the

"old field pay zone" and the Lovington Sand zone without any danger of waste or impairment of correlative rights."

I would like to offer this letter in evidence, have it marked and offered in evidence for the record in the case.

MR. PAYNE: Mr. Ford, is anybody in this pool flooding the Lovington zone?

A Not in the immediate area, no, sir.

BY MR. NUTTER:

Q What do these triangular well symbols indicate on your exhibit?

A Actually those are the wells that are still owned by Western-Yates.

Q Which are the wells that are completed in the Lovington zone of the San Andres?

A Those same wells.

Q Do you know if any steps are being taken to protect them from the effects of the water flood in the area?

A We have discussed that with Western-Yates and what we have agreed to do is for them to take producing tests on those wells, and as I pointed out, the wells are so old that the records are of doubtful value. We'll probably go in just as we did this well and log them in every way we can think of and get the information. So we have to start on those right away too.

Q Well, now, I note that on this Exhibit No. 1 there are

four wells with a triangular symbol and they all happen to fall in the water injection well pattern.

A That is correct.

Q Are there any Lovington wells that don't fall in the water injection pattern?

A No.

Q So in all probability should this application be approved, you would propose some similar installation for these others?

A Yes, sir.

Q You stated that you believed there had been some cavein problem in the first Grayburg zone and possibly also in the Lovington zone. Do you think that with this cavein problem you'll be able to pull this seven inch liner? You think it's more likely that you will be able to pull it or not be able to pull it?

A I think we'll be able to get it, but it's conceivable that we might not.

Q If you can't pull all of it, you are going to shoot it off and pull as much as you can?

A That is the plan. It will become almost an operating problem from day to day as to what we can do with it, working hand in hand with Western-Yates.

Q Assuming that you can't get it all but you are able to get a portion of it, will the five and a half inch pipe go down

below the top of the seven inch liner after you have pulled it out and cut some of it?

A Yes, it will go down and we will set a packer. It will go below where we cut it off and be set on a packer shoe in an attempt to protect the Lovington.

Q How would you cement that in?

A You would have ports above your packer shoe that would allow your cement to come back up. It's conceivable that your cement could come back up, come over the top of the liner and come back down and get into the Lovington.

Q That's what I was wondering, if you could cement the Lovington off that way.

A That's just something you never know as to how much caveins are behind the liner. You would assume there are caveins behind the liner so that you cannot cement the pay.

Q Well now, do you think that the caveins behind the liner would be such that perhaps if you flooded the Grayburg zone with another well in the same area that you might not flood the Lovington, or would the caveins be permeable enough that the water would go down to the Lovington?

A I think the caveins, well, that's very much, very much an opinion, but I would think that the water would go down to the Lovington through the caveins with that much pressure.

Q In any event, whether you get all the seven inch liner

or none of it or just a portion of it, the five and a half inch pipe would be cemented to the surface?

A Yes. If we cannot get all of the seven inch liner, we will, as I say, set this pipe in there and cement it, and it's very possible that the Western-Yates will not want to produce their Lovington pay because if they don't have casing cemented through it they can't frack it and make it a decent well. They'll probably just leave it there until we get through water flooding and maybe put it back on making two barrels a day, but we're just, if we can't get that liner out we are going to have to sacrifice the Lovington pay.

Q Do you plan to use new pipe for the five and a half inch string?

A Yes, sir. Western-Yates informs me that as far as completing this Lovington, as the situation stands now, as the economic situation stands for them, if the first Grayburg wasn't even there, if it was no problem at all they feel that they could run five and a half and even if the liner wasn't there they could run in five and a half inch, fish the liner out, run five and a half inch, cement and frack this Lovington and the money that they would recover from it based on the experience in the area would just about pay for the job, the string of pipe, the frack job, and all, but since we have to go in there in any way the additional 400 feet of pipe is very small cost, and seeing it's a joint effort

we agreed to furnish it.

Q Including the extra 400 feet?

A Including the extra 400 feet. So they will have a chance at fracking their Lovington zone and making some oil. If we don't go this route, the chances are it will never be fracked.

Q Now, I realize that the records on these wells are rather hazy, but what is the formation between the first Grayburg and the Lovington section, is that a shale or just what is that, do you know?

A I couldn't say.

MR. CAMPBELL: Doesn't the log reflect it?

A Yes, probably would.

Q Mr. Ford, do you know of any plans that Graridge may have or Western Development, or anyone else for that matter, for flooding the Lovington Sand some day?

A We have no interest in it so we cannot flood it. I would think that Western-Yates must have that in the back of their mind that at some future time, I would judge that you have fifteen to twenty wells in it, anyway probably more, but they do run generally south of this Grayburg production.

Q So you haven't made any study of it to determine the desirability of flooding it?

A No, no study at all, no.

MR. NUTTER: Does anyone else have any questions of

Mr. Ford?

MR. PAYNE: I have a question.

BY MR. PAYNE:

Q That doesn't relate particularly to this case, but assuming that you had a project allowable in a water flood and the injection well would also receive an allowable, presumably so that in this case you would have an allowable for an injection well and allowable for a producing well, and yet at the same time if you had two primary wells you would only get one allowable. That doesn't seem quite right, does it?

A Wouldn't you be able to divide, I don't know your procedure, but I would assume can't you divide your well up into two fields vertically?

Q Yes, assuming there are two separate fields. Assuming this is one pool, which it has been treated as in the past at least from the standpoint of proration, you would get one allowable per 40-acre tract, you could divide that up between two producing wells but our allocation you see when it was water flooded you would get a full allowable for the injection well and a full allowable for the producing well.

MR. CAMPBELL: The question is rather theoretical. In most areas where you are water flooding above areas where you only get two barrels of oil a day.

MR. PAYNE: I would like to get the thinking of the

engineers while they're available.

A Actually I say that the first Grayburg developed was produced good before the days of proration. By the time the proration came along it was down to two, three, four, five barrels a day. Then I don't know what happened when they deepened to the Lovington zone, but they probably couldn't make any more than their 40 barrels a day or whatever their allowable was, so there was no real reason to set up a separate field. They probably should be theoretically the Artesia-Grayburg Field, and the Artesia-Lovington Field, but there has been no allowable reason for doing so.

MR. PAYNE: I see, thank you.

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

(Witness excused.)

MR. CAMPBELL: I would like to offer Exhibits 1 through 4 in evidence.

MR. NUTTER: Graridge Exhibits 1 through 4 will be entered. Does anyone have anything further they wish to offer in Case 1797? We'll take the case under advisement and recess the hearing until one-fifteen.

(Whereupon a recess was taken until one-fifteen.)

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, 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 4th day of November, 1959.

Ada Dearnley
Notary Public-Court Reporter

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. 1797, heard by me on 10-28, 1959.

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