

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico

IN THE MATTER OF:

Case No. 1195

TRANSCRIPT OF PROCEEDINGS

DEARNLEY - MEIER & ASSOCIATES  
INCORPORATED  
GENERAL LAW REPORTERS  
ALBUQUERQUE - SANTA FE  
3-6691 2-2211

January 9, 1957

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
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IN THE MATTER OF:

Application of Graridge Corporation, Gulf Oil :  
Corporation and Great Western Drilling Company :  
in compliance with Rule 701 (a) of the New Mexico :  
Oil Conservation Commission Statewide Rules and :  
Regulations for an order granting approval of :  
applicants proposed pilot water flood program in :  
the Queen formation in the Caprock-Queen Pool in : No. 1195  
Lea and Chaves Counties, New Mexico. Applicants :  
in the above-styled cause seek approval of their :  
proposed pilot water flooding program for the :  
purpose of secondary recovery in which water :  
injection will be made into the Queen formation :  
through six injection wells; said wells to be :  
located in the S/2 of Section 31, Township 12 :  
South, Range 32 East, the NE/4 of Section 6 and :  
NW/4 of Section 5, Township 13 South, Range 32 :  
East, Caprock-Queen Pool, Lea and Chaves Counties :  
New Mexico. :

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BEFORE:

Mr. Warren W. Mankin, Examiner

TRANSCRIPT OF PROCEEDINGS

MR. MANKIN: The hearing will come to order. The next  
case on the docket is Case No. 1195.

MR. GURLEY: Case No. 1195, the application of Graridge  
Corporation, Gulf Oil Corporation and Great Western Drilling Com-  
pany in compliance with Rule 701 (a) of the New Mexico Oil Con-  
servation Commission Statewide Rules and Regulations for an order  
granting approval of applicants proposed pilot water flood program  
in the Queen formation in the Caprock-Queen Pool in Lea and Chaves  
Counties, New Mexico.

MR. ELLIOTT: Mr. R. L. Elliott, Attorney for Graridge Corporation, and representing Gulf Oil Corporation and Great Western Drilling Company, in addition to Graridge, relative to this application, and we have one witness to be sworn.

MR. GURLEY: State your name, please.

MR. VICH: Robert H. Vich.

(Witness sworn.)

ROBERT H. VICH

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

DIRECT EXAMINATION

BY: MR. ELLIOTT:

Q Mr. Vich, you are Water Flood Engineer with Graridge Corporation in Texas?

A I am.

Q Have you been qualified before the Commission previously before this time?

A Yes, sir, on two different occasions, separate applications. On the first one, the application for the Red Lake Unit in Eddy County, New Mexico; the second time was an application for pilot water flood by the Ibex Company in Eddy County, New Mexico, on the 13th of December 1956.

MR. ELLIOTT: Is the Examiner satisfied with the qualifications of the witness?

MR. MANKIN: The qualifications are satisfied. Proceed.

MR. ELLIOTT: We would first like to present our

Exhibit No. 1, which sets up the field plat of the area, showing all the oil wells, location of the proposed pilot water flood--

MR. MANKIN: You want this marked Exhibit No. 1?

MR. ELLIOTT: Yes, sir. I believe it is already marked up there.

MR. MANKIN: All right.

Q Mr. Vich, you are familiar with this field plat and the pilot water flood project set up thereon?

A Yes, it was prepared under my direction and is true as represented.

Q Would you discuss with the Examiner the location of the wells?

MR. MANKIN: Would you speak up, please, so that everyone can hear?

MR. ELLIOTT: You want me to re-state that question?

MR. MANKIN: No, go ahead, please.

A The proposed pilot water flood is outlined in the center of Exhibit No. 1 in portion of Section 31, Township 12 South, Range 32 East, and Section -- wait a minute. We got the wrong exhibit. I am sorry. We made a mistake.

MR. MANKIN: The exhibit that you just gave out is not for Case No. 1195, but for Case No. 1196?

A That's correct, sir.

MR. MANKIN: You want that marked Exhibit No. 1?

A Yes, sir.

(Graridge's Exhibit No. 1  
marked for identification.)

A (Cont'd) The Exhibit No. 1, as we have presented, has outlined the proposed pilot flood pattern, showing the six injection wells in portion of Section 31, Township 12 South, Range 32 East, and portion of Section 6, Township 13 South, Range 32 East of Lea County, New Mexico. And also shown on Exhibit No. 1 are the proposed water supply wells which are currently completed and which will be discussed later; and also the area that will be affected by the proposed pilot water flood program is outlined on Exhibit No. 1.

MR. ELLIOTT: May it please the Examiner, we would like to put in evidence now as Exhibit No. 2 a Data Sheet, which will be briefly discussed, relative to the production.

MR. MANKIN: You only have one copy of this?

MR. ELLIOTT: Here is another one.

(Graridge's Exhibit No. 2  
marked for identification.)

Q Mr. Vich, will you discuss this Data Sheet briefly with the Examiner as to production in the area, depth, and so forth?

A The Data Sheet contains the proposed flooding plans and outlines the reservoir conditions and the expected recoveries, and our source of water supply, with the general discussion, and the cumulative production, by a lease, and also there is an attachment on the back of the wells, producing wells to be affected by the proposed pilot, and also the cumulative production, primary production from these to be effected wells.

Q What is the sand or formation that you propose to pilot flood?

A It is the Artesia or Red Sand interval of the Queen formation found at a depth of approximately three thousand feet, or plus one thousand four hundred fifty sub-sea feet.

Q Do you have any other discussion relative to the Data Sheet to make at this time?

A No, that is all.

MR. ELLIOTT: May it please the Examiner, I would like to present as Exhibit No. 3 a Structure Map of this pool.

(Graridge's Exhibit No. 3  
marked for identification.)

Q Mr. Vich, do you have any discussion relative to this Structure Map?

A The Structure Map is as shown on the exhibit and due to the well completion methods in the sub-pool, we were unable to obtain definite sand thickness. Most of the wells were completed, drilled with rotary down to approximately three thousand feet and drilled in with capable tools, and all of the sub-sand section was not drilled in all of the wells, so we were unable to complete an isopach map of the area. But the overall sand thickness averages approximately ten to twelve feet as far as we could ascertain.

Q Mr. Vich, do you know whether or not an agreement has been entered into between Graridge, Gulf and Great Western relative to a cooperative flood?

A Yes, sir, the proposed program was worked out on a

lease-line cooperative basis between Graridge, Great Western and the Gulf Oil Corporation as to method of participation and joint sharing in costs and so on, which is all outlined in the unit agreement of which we have a copy here.

MR. ELLIOTT: At this time, if it please the Examiner, I would like to introduce as Exhibit No. 4 an executed copy of this water flood agreement between the three companies. Is that all the copies you have?

MR. MANKIN: Do you desire to withdraw this and substitute another copy? Do you have another copy that could be substituted and submitted?

MR. ELLIOTT: We could make a photostatic copy of that.

A We have ample executed copies in our office. That is a spare.

(Graridge's Exhibit No. 4  
marked for identification.)

MR. ELLIOTT: We can retain this?

A Yes.

MR. ELLIOTT: Would one copy suffice?

MR. MANKIN: Yes, sir.

Q Mr. Vich, at this time, would you discuss with the Examiner your well completion program for this project?

A Well, we definitely intend to isolate the water injection into the Queen sand formation. The present completion of all the producing wells in the area, the casing, the oil production, string of casing is set at approximately three thousand

feet which is some thirty to forty feet above the pay interval and we plan to set in cement liners from the bottom of the casing to the top of the Queen sand into the top of the Queen sand to confine the water injection definitely to the Queen formation.

Q What have you done about your water supply? Have you had approval to use water in that area from the state engineer?

A Well, to begin with, in one of the old producing wells drilled earlier in the field, had been taken down to the San Andres formation, which is at approximately 4385 feet, and from the San Andres they had an indicated show of salt water. We tried to re-enter this well, which is in Section 31, Township 12 South, Range 32 East, to obtain this salt water supply to be used for flooding purposes. Due to junk, miscellaneous material in the hole, we were unable to re-complete the well and had to abandon the endeavor, and subsequent to that Great Western Drilling Company deepened one of their Queen sand wells approximately six miles south of this proposed area and to the San Andres and obtained approximately 120 barrels per day from the San Andres after a 10,000 acid treatment and this project was abandoned as a possible source of injection water. During this interval we have been working with the Amarada Petroleum Corporation in an effort to obtain salt water from the east Caprock-Devonian salt water disposal system which is currently being installed. The present status of that is that Amarada has informed us that they are conducting investigation of possibly re-injecting the salt water from the

disposal system back into the Devonian Formation and their investigation won't be complete for approximately six months to another year's time, so we have made application to the state engineer's office for the use of fresh water from presently completed water wells in the 350-foot sand interval occurring locally in the area of Section 31 and Section 6 and have obtained approval from the State Engineer's office for the use of 94 acre feet per annum from each of these water wells for use in the pilot flood.

Q What depths are these water wells?

A Approximately 350 feet, a sand interval of 350 feet, which is water productive. The wells have been tested and are capable of producing in excess of 2000 barrels per day each.

Q Mr. Vich, is this telegram and other papers pertinent to the application, the ones that you have in your file with reference to obtaining permits for the use of these fresh water wells?

A Yes, sir, that is.

MR. ELLIOTT: At this time I would like to introduce as Exhibit No. 5 the telegram and other papers pertinent to this showing that the use of these two fresh water wells has been approved.

MR. MANKIN: Do you desire to have these returned or do you wish to have these made a matter of record?

A We have copies of that.

MR. MANKIN: Exhibit No. 5?

A Yes, sir.

MR. MANKIN: Call it No.5-A, 5-B and 5-C.

(Graridge's Exhibits Nos. 5-A,  
5-B and 5-C, respectively,  
marked for identification.)

Q Mr. Vich, generally is this project as proposed in the interest of conservation and prevention of waste?

A We definitely consider it so from an engineering standpoint. The majority of the wells in the Caprock pool, in this portion of the pool, are at the approximate economic limit and unless some secondary recovery means is installed, a great majority of the wells will have to be abandoned due to economic conditions and with the subsequent loss of the volumes of oil that we have indicated on Exhibit No. 2 which can be recovered by water flooding would be otherwise unrecoverable.

MR. ELLIOTT: I believe that's all the questions we have at this time but at this time I should like to give Gulf Oil Company, which is represented, an opportunity to make a statement or ask any questions.

MR. KASTLER: We will get to that very shortly.

MR. GURLEY: We would like to ask one thing, Mr. Elliott. Suggest that you finish qualifying your exhibits as to the preparation, if you will, sir; as to whether or not they were prepared by him or under his direction.

Q Mr. Vich, these five exhibits that we have entered here.

were they prepared by you or under your direction?

A Yes, sir, they were either prepared by me or under my supervision. Yes, sir.

MR. GURLEY: You want to move the admittance of your exhibits?

MR. ELLIOTT: I move that these five exhibits be introduced into evidence as a matter of record.

MR. MANKIN: Is there any objection to entering Exhibits Nos. 1 through 5 in Case No. 1195? If not, they will be so entered. Do you have anything further?

MR. KASTLER: Nothing further. Gulf Oil Corporation does not have anything to add at this time. This matter has been discussed with our water flood people in Fort Worth. The question is somewhat open. Mr. Walker wasn't instructed to come in and make any further statement at this time, but we are going to examine the exhibits at an early date and we will enter our statement later.

MR. GURLEY: No cross-examination of the witness at this time?

MR. KASTLER: No, we don't --.

MR. GURLEY: Just a moment. We are going a little ahead.

MR. MANKIN: You want to finish the questioning before we get the statements?

CROSS-EXAMINATION

BY: MR. MANKIN:

Q Mr. Vich, this proposed pilot water flood is essentially

all on State lands, is that correct?

A That's correct.

Q All of the injection wells and the producing wells of Gulf, Graridge and Great Western are essentially in a standard location, is that correct?

A That's correct.

Q The pilot water flood which you propose to put in is essentially a five spot pattern?

A Two eighty acre five spot pattern.

Q Two eighty acre five spot patterns?

A Yes, sir.

Q Do you wish to amend your application to reflect that instead of the Caprock field, that this is the Caprock-Queen pool? In New Mexico we use the term "pool." Would you like to amend your application accordingly?

A Yes, we would.

MR. MANKIN: We will accept that amendment.

Q Mr. Vich, you indicated that the State Engineer's office has authorized the use of this fresh water from a zone of approximately 350 feet. Was this authority for just the pilot flood operation?

A That's correct.

Q After the pilot flood has been determined, the amount of water, if it is to be taken from a fresh water zone, would then be determined?

A That is correct. Well, we are in the process or we will continue to investigate the other water source supplies for possible expansion of the pilot flood if it proves successful.

MR. MANKIN: Are there any other questions of the witness?

MR. GURLEY: I have a question. On your Exhibit No. 1, Mr. Vich, you indicate that part of these wells owned by Malco and Livermore are affected. Is Garridge the operator for these particular wells?

A Yes, sir. The operator's name is on the top of the lease there.

MR. GURLEY: Oh, I see. That's fine. Thank you.

MR. MANKIN: Any other questions?

MR. ELLIOTT: Just for the purpose of clarifying that, I would like to ask whether or not other producers are involved in this other than Great Western or Gulf?

A They are the only ones that have producing wells that will be immediately affected by the proposed pilot flood.

MR. IRBY: I am Frank E. Irby. With respect to the State Engineer's permit, you stated the limitations that were placed on there with respect to the acre field of water and with respect to the pilot flood. Is there not another limitation there in time?

A Yes, sir. In our application I believe it is definitely stated for the time element of the pilot. I believe it is seven

years, I am quite sure.

MR. IRBY: There is a date of termination on your approval there, isn't there?

A This was just a notice that the approval would be forthcoming, Mr. Irby.

MR. IRBY: The time element is approximately eighteen months from the date of your application. I want to get that into the record. I didn't realize that you didn't have the approved permit.

A I see.

MR. IRBY: Would it be agreeable to Graridge Corporation and the Commission to enter that final date in your record on information from our office or from Mr. Vich's either?

MR. GURLEY: You stipulate that that would be the date. Is that what you are asking, sir?

A Well, Mr. Irby stated that the formal, I mean, the formal approval of our application, which will be forthcoming in a few days, which was noted on the telegram, did stipulate that the time element was eighteen months.

MR. GURLEY: And you gentlemen are agreeable to that date?

A Yes, sir.

MR. GURLEY: We will enter into the record.

MR. MANKIN: Are there any further questions? I have a question.

MR. MANKIN: Mr. Vich, your Exhibit No. 2, which was your water flood data, indicated that there was to be injection, initial injection of about 500 barrels per day per well, is that correct?

A Yes, sir.

Q And there are six wells?

A Yes, sir.

Q And would all six wells be put in at the same time?

A Yes, sir.

Q So there would be some 3000 barrels a day that would be utilized for injection purposes?

A That's correct. Now the situation that exists is that we presently have a right from the State Engineer's office for a varied volume of water which is currently being used in the properties for cementing operations and drilling operations and domestic use in the camp site, and we were instructed to make our one application to include both, both industrial uses, I mean, the current uses and the water flooding under one total.

MR. MANKIN: What would be the total withdrawal from the two wells, the two source wells of water per day?

A It would be a minimum of 3000 and a maximum, never a maximum of over 4000. It would range between there -- depending upon the water consumption for drilling purpose and de-salting and general lease operation.

MR. MANKIN: So 3000 to 4000 barrels a day would be

the amount of water drawn from these two wells. Would the wells support such withdrawal?

A Yes, sir, they have been tested.

MR. MANKIN: And would those at 4000 barrels a day be within the acre-feet withdrawal as granted by the State Engineer's office?

A That is correct, yes, sir.

MR. MANKIN: Are there any other questions of the witness?

MR. MANKIN: How soon do you expect to obtain results from this flood? I don't believe that was in your water flood data determination was it, Mr. Vich?

A No, sir. We estimate between six months and a year's time. We don't have definite data concerning the exact sand thickness due to gas and such from the reservoir. We have good production record, oil production record, but without the other matter we were unable to definitely ascertain more or less exact fill up time in response to the flood.

MR. MANKIN: So you don't know what percent fill-up you would expect at six months time?

A No, sir. We would definitely be able to evaluate the pilot program sometime between six months and a year's operation, we are quite sure.

MR. MANKIN: When you say "evaluate the program," you feel that within six months to a year's time you would have

obtained some beneficial results?

A Yes, sir.

MR. MANKIN: Some increase in production?

A Yes, sir.

MR. MANKIN: Are there other questions of the witness?

If there are no further questions of the witness, the witness may be excused in this particular case. Is there any statement to be made in this case? I believe we already have one essential statement made by Gulf. Does Great Western wish to make one?

MR. CRUZ: Yes, sir. I am O. H. Cruz of Midland representing Great Western Drilling Company and we wish to concur in this application.

MR. MANKIN: Any further statements? Does Amerada wish to make any statement at this time? If there is no further statement, we will take the case under advisement.

(Witness excused.)

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

I, J. A. Trujillo, 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, the 31 day of January, 1957.

J. A. Trujillo  
NOTARY PUBLIC - COURT REPORTER

My Commission Expires:

October 5, 1960