

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico

IN THE MATTER OF:

Case No. 1194

TRANSCRIPT OF PROCEEDINGS

DEARNLEY - MEIER & ASSOCIATES  
INCORPORATED  
GENERAL LAW REPORTERS  
ALBUQUERQUE - SANTA FE  
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January 9, 1957

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico

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IN THE MATTER OF:

Application of Magnolia Petroleum Company for  
permission to convert its T Betenbough No. 2  
Well into a salt water disposal well in the  
Pennsylvanian formation of the Bough Pool in  
accordance with New Mexico Oil Conservation  
Commission Statewide Rule 701.

No. 1194

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BEFORE:

Mr. Warren W. Mankin, Examiner

TRANSCRIPT OF PROCEEDINGS

MR. MANKIN: The next case on the docket is Case  
No. 1194.

MR. GURLEY: Case No. 1194. Application of Magnolia  
Petroleum Company for permission to convert its T Betenbough  
No. 2 Well into a salt water disposal well in the Pennsylvanian  
formation of the Bough Pool in accordance with New Mexico  
Oil Conservation Commission Statewide Rule 701.

(Witness sworn.)

R. J. CHRISTENSEN

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

DIRECT EXAMINATION

BY: MR. MADOLE:

Q Mr. Christensen will you state your name, please.

A R. J. Christensen.

Q Have you previously testified before this Commission in any matter?

A No, sir.

Q Will you outline your educational background, please.

A I have a Bachelor of Science Degree from the University of Houston 1952, worked as petroleum engineer for Magnolia since that date. Presently, I am area petroleum engineer in Hobbs, New Mexico.

Q Will you outline some of your previous experience in Magnolia Petroleum Company, Mr. Christensen.

A I was area engineer in Electra, Texas, at which time I worked on secondary recovery work and I have testified as a technical witness at the Railroad Commission in Austin, and have been in the New Mexico area since August of 1955.

MR. MADOLE: Are the Witness's qualifications acceptable?

MR. MANKIN: The qualifications are acceptable, yes.

Q In Case No. 1194, Mr. Christensen, Magnolia Petroleum Company is proposing to convert it's T Betenbough Well Number Two, as described, into a salt water disposal well. I would like at the outset if the Commission, please, to correct an allegation in the petition in which it is alleged that this well is plugged and abandoned; it should be that this well was temporarily abandoned, and that actually, it had not been plugged. Mr. Christensen,--

MR. GURLEY: Just a minute, Mr. Madole.

MR. MANKIN: Your recommendation for the amendment is acceptable.

Q This application is part of the program for salt water disposal brought about in the hearing conducted in Case No. 1053,

is it not, Mr. Christensen?

A Yes, that is correct.

Q Do you have a map showing the location of the intake well, and location of the oil and gas wells, showing the drilling wells, dry holes, leasees, and operators, and offset operators in this field?

A Yes, sir, I do have.

Q That map is attached as Exhibit A to the petition. I ask that this be marked as Magnolia's Exhibit No. 1.

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

Q State whether or not the wells producing in the field-- From what formation are they producing?

A The wells in this Bough Field are producing from the Bough Lime, which is an oolitic limestone of Pennsylvanian age.

Q What is the original oil-water contact?

A The estimated oil-water contact in this field was 5620 subsea.

Q Where do you propose to inject salt water in this well?

A We propose to inject salt water in the T Betenbough No. 2 through open hole from 9606 to 9639, this is a subsea depth of 5476 to 5509.

Q What is the total depth of this well?

A The total depth is 9639.

Q Have you conducted injection tests on this well?

A Yes, we have.

Q Will you outline them for the Commission, please?

A We injected salt water into this well for the purpose of determining injectivity of the well, at which time we found that we could inject three barrels per minute with the vacuum that the well had. We feel that this well has a capacity to easily handle the produced water and supply gravity in the gravity system.

Q In this program you propose to take care of all water in the Bough Field?

A Yes, that is correct, we will handle injection from the J. R. Sharp Lease.

Q On exhibit one there is shown a Forest Oil Company, and it is my understanding that their well has now been abandoned, is that right?

A Yes, that is correct.

Q So the only operator in the field beside Magnolia Petroleum Company is J. R. Sharp?

A Yes.

Q And part of the salt water disposal program in Case No. 1053 is for all of the operators to dispose of their water through this injection well?

A Yes.

Q What is the total amount of water estimated to be in the field at this time?

A We estimate at this time approximately fifteen hundred barrels of salt water a day for disposal purposes.

Q Your test of this well shows that it will clearly dispose of a larger amount than that amount.

A Yes, that is right.

Q It is ultimately estimated that the salt water produced

would be in excess of three thousand barrels. Will the well dispose of that water?

A Yes, we feel that it will easily handle that much water.

Q Do you have an electrical log of this well?

A Yes, we do have.

Q We will ask that exhibit be marked as exhibit two.

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

Q Is there marked in red the zone for injection in that electrical log?

A Yes, the open hole interval is marked in there.

Q And you testified a while ago-- On what is that injection?

A On the Bough Lime Pennsylvanian age.

Q In our application we have set the casing program that is shown in this well. Will you briefly state to the Commission the casing program of this well.

A Yes, sir. The casing program for this well is as follows: 13-3/8 inch surface casing at 353 feet with 350 sacks of cement which we circulated 12 sacks of cement; 9-5/8 inch casing at 4438 with 1400 sacks at 6 per cent gel; 700 sacks of Wellite, 200 sacks of neat cement and this also was circulated 7 inches at 9606 with 1126 sacks of 4 per cent gel, 563 sacks of Wellite, 250 sacks of neat cement. Plug stopped at 8647 with 2500 pounds pressure. The top of cement outside the 7 inches is at 370, as determined from temperature surface. Sixty feet of scratchers were run on the casing at depths as follows: 9602, 9536, 9472, 9409, 4466, and 4401. We propose to inject through the casin in this well.

Q Who will be the operators of this injection system?

A The operator will be Magnolia Petroleum Company, Box 900, Dallas, 21, Texas.

Q In your opinion, is this application to dispose of this salt water in this manner, in the interest of conservation, and an aid in the prevention of pollution of fresh water stratas in New Mexico?

A Yes, it is.

Q Have you made a test of the water proposed to be injected to determine its salt content?

A Yes, we have.

Q Will you give us that information, please.

A This test is of the produced water from the Bough Lime, and the chlorine content of this water runs approximately 67000 parts per million; sulphate, 900 parts per million; all the remaining number will be in the part per million; calcium, 6200, magnesium 1300, iron 26, carbon dioxide 194, sodium 34000, with a total solid of 110,000.

Q Then, in your opinion, is this water proposed to be injected, is it in any wise fit for human consumption or domestic or livestock operations?

A Yes.

Q It is not.

MR. MADOLE: That is all the questions we have, sir.

#### CROSS EXAMINATION

BY: MR. MANKIN:

Q Mr. Christenson, is the open hole zone in which disposal is to take place, essentially below the oil-water contact of the Bough Pool?

A Yes, sir it is in the northern edge of the field. We are injecting there at subsea intervals of 6478 to 6509 and we estimate the present oil-water contact to vary from 5500 to 5470. We have two wells. One, the Markham No 1, which is structurally a little higher, and also the T. Betenbough No. 3 on the east side of this lease. This well, Markham No. 1 is nearing its economic limit at this time. The water cut on that is 86 per cent, and Well No. 3, the T. Betenbough No. 3, which is possibly structurally higher was completed at a later date, and it is still producing.

Q So essentially, the disposal would be either at the oil-water contact or below the oil-water contact?

A Yes.

MR. MADOLE: The injection well has gone to complete water?

A The injection well has gone to 100 per cent water.

Q Is this proposed injection well essentially one of the lowest wells in the Pool?

A No sir, it is not. We have wells on the west in the Markham--Betenbough area which would be lower.

Q Which would be lower?

A Yes, sir.

Q In the same zone, the "C" zone of the Bough Pool?

A Yes, that is correct.

Q All these wells are essentially the same, "C" zone?

A Right.

Q Would you give for the record the location of this well? The actual footage from the section line.



MR. MADOLE: That information is contained in your plat, Exhibit 1, if you will read it.

Q Will you relate it for the record, what is the location?

A This well is located in Section 12, Township 9 South, Range 35 East, and the well is located 660 feet from the south line and 1314 feet from the west line of this section.

Q Are you sure of that? Doesn't your exhibit show 1200 feet from another well rather than the section line?

A Yes, that is correct.

Q What is the location from the west line?

A Let me change that distance from the west line. That's 660 feet from the south line and 1975 feet from the west line.

MR. MANKIN: Thank you. Is there any other questions of the witness?

MR. MADOLE: I ask that Exhibits 1 and 2 be accepted in evidence.

MR. MANKIN: Is there any objection to entering Exhibits 1 and 2 in this case? If not, they will be so entered. If there is nothing further, the witness may be excused.

(Witness excused.)

MR. MANKIN: Is there any statements to be made in this case? If not, we will take the case under advisement.

MR. IRBY: I don't know that this need to go into the record, Mr. Examiner, but I thought I would make a remark.

MR. MANKIN: Would you relate your remark, please?

MR. IRBY: I am Frank Irby with the State Engineers Office. My statement is just to express the States Engineer's

appreciation for the manner in which the operators have attacked this problem, and we're certainly well pleased with the progress they are making, and I know there are not very many of them present here today, but I would like the operators to know that we appreciate the fact that they are trying to dispose of this salt water in a manner which will be consistent with public interest.

MR. MANKIN: Thank you.

MR. MADOLE: On behalf of the operators, we appreciate that expression.

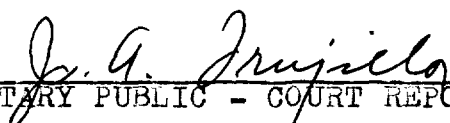
MR. MANKIN: Is there anything further? If not, we will take the case under advisement.

We will take about a five minute recess.

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

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 11th day of January, 1957.

  
NOTARY PUBLIC - COURT REPORTER

My Commission Expires:

October 5, 1960.