

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO

CASE NO. 1137

TRANSCRIPT OF HEARING

SEPTEMBER 26, 1956

DEARNLEY-MEIER AND ASSOCIATES
COURT REPORTERS
605 SIMMS BUILDING
TELEPHONE 3-6891
ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO
SEPTEMBER 26, 1956

IN THE MATTER OF: :

CASE NO. 1137: CONTINUED CASE :
Application of Humble Oil and Refining Company: :
for permission to convert its State "A" Well :
No. 2 into a salt water disposal well in the :
San Andres formation of the Hobbs Pool in ac- :
cordance with New Mexico Oil Conservation Com- :
mission Statewide Rule 701. Applicant, in the :
above-styled cause, seeks an order granting :
permission to convert its previously abandoned: :
State "A" Well No. 2 into a salt water dis- :
posal well; said well is located 330 feet from: :
the South and East lines of Section 25, Town- :
ship 18 South, Range 37 East, Lea County, New :
Mexico. Applicant proposes to inject salt :
water below the oil-water contact of the San :
Andres formation in the Hobbs Pool. :

BEFORE:

Daniel S. Nutter, Examiner.

T R A N S C R I P T O F P R O C E E D I N G S

MR. CHRISTY: S. B. Christy, for the Applicant?

(Witness sworn.)

R. S. DEWEY,

called as a witness, having been first duly sworn, testified as fol-
lows:

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Mr. Dewey, I believe you have been sworn?

A Yes, sir.

Q State your name, address, occupation.

A R. S. Dewey, Division Petroleum Engineer, Humble Oil and Refining Company, Midland, Texas.

Q I believe you filed an application for salt water injection on the State "A" No. 2 Well in the SE SE of 25, 18 South, 37 East, Lea County, Hobbs Field?

A That's right.

Q Would you please explain, briefly, the reason the application was made and the proposed plan of operation if the application is granted?

A Due to the desire of Humble Oil and Refining Company to expedite the disposal of produced salt water into some formation rather than allowing it to evaporate or seep into the ground, Humble Oil and Refining Company is seeking this application to dispose of produced salt water.

Q In connection with the log required by Rule 701 of the conservation rules, I believe you have had prepared a cross section map which is attached to your application, is that correct, sir?

A It wasn't attached to the original application.

Q Was not?

A No, sir, but --

Q You have had such a cross section prepared?

A Since that time.

Q Yes, sir. Would you please explain briefly the meaning of the cross section map and what you were attempting to determine from it?

A This cross section was prepared by one of the geologists for

Humble Oil and Refining Company, using logs that were available to him in the immediate vicinity of the Humble State "A" 2 Well, Hobbs Pool. The logs are gamma ray logs, and he was able to find but three gamma ray logs that had penetrated sufficiently deep into the San Andres formation to use in estimating possible zone of permeability below the oil and water production currently being produced from the Hobbs Pool.

Q This map is prepared from the best information you had available?

A It was, yes.

Q Now, referring, again, to the State "A" No. 2 Well, what is the old depth of the well and the formation involved?

A This well was completed and placed on production December 1, 1930. Seven inch casing was set and cemented with 380 sacks of cement at 4110 feet. The well was drilled originally to 4230 feet and later deepened to 4250 feet. In January 1947, the well was plugged and abandoned due to having gone to 100 percent water. In the plugging operations, the open hole below the seven-inch casing seat was filled with cement, a 50-sack casing plug was set in the seven-inch casing at 3439 feet and the seven-inch casing was shot off at 2400 feet. The well was plugged with 50 sacks cement from 2275 to 2400 feet. The 9-5/8-inch intermediate casing was shot at 600 feet. The well was plugged at 650 feet and at 200 feet with 50 sacks of cement. Twenty-five sacks of cement was used to plug the well at the surface.

Q Now, have you made an investigation concerning the probable water level in the Hobbs Pool, in addition to the log?

A As a matter of fact, the only investigation for additional permeable sections underlying the Hobbs Pool consists of geological work on this cross section.

Q I believe the New Mexico School of Mines has made a report concerning that oil-water table level in there, is that correct?

A That's correct. In discussing the Hobbs Pool on Page 226, of New Mexico School of Mines Bulletin No. 18, it is stated that "The original water level in the reservoir, between 617 and 619 feet below sea level, was uniform in all porous zones". Using a well elevation of 3658 and 619 below sea level, it is estimated that the original oil-water contact in Humble Oil & Refining Company's State A-2 well was at a depth of 4277 feet. As the original total depth of State A-2 was 4230 feet, the bottom of the water table connected to the Hobbs Pool at this location was not determined.

Q And has not yet been determined?

A No, it has not, the well has never been deepened to that depth.

Q Will you tell the Commission briefly your proposed plans as to casing and pipe, et cetera, on the injection drilling, that you plan if this application is allowed?

A In the event permission is obtained from the New Mexico Oil Conservation Commission, Humble intends to drill out the cement plugs in their New Mexico State A-2 well and deepen the well below the oil-water contact in search of a lower zone of permeability which may be used for water disposal. Either a combination string

of 5 and 5-1/2-inch casing or a full string of 5-inch will be set on bottom and gun perforated opposite the permeable zone used for water disposal. In either event, the casing below the 7-inch casing seat will be 5-inch flush joint casing to afford as large an annular space as possible in the 6-1/4-inch open hole. This string of casing will be cemented to the surface in two stages to protect the upper formations from water intrusion. As the well is deepened, the formations will be tested to determine a zone or zones of permeability suitable for water disposal. This testing will consist of coring or drill stem testing or a combination of the two. It may be necessary to acidize or sand frac the zone or zones of permeability selected for water disposal.

Q Now, sir, where is the source of the water you propose to inject in the well?

A The water that we propose to inject in the well is water that is gathered at the various tank batteries located belonging to Humble Oil and Refining Company, and it is water that is produced to -- incident with the production of oil from the Hobbs Pool.

Q What is Humble's present estimate as to the amount of injection water daily?

A Our estimate of the proposed water from just Humble property is approximately 150 barrels per day.

Q Now, I believe I asked you, and in the possibility of repeating myself, the formation of production I believe you said is the San Andres?

A Yes, sir, the well was completed and produced from the San Andres.

Q Now, in connection with your application, I believe you gave notice to a number of offset leasehold and operator owners in the area by letter of August 6, a copy of which has been furnished to the Commission, is that correct, sir?

A I don't know as the Commission has been furnished a copy of the letter of August 6, but I can read that letter of August 6, if you care to have me.

Q Would you just briefly give us the names of the correspondents to which it was addressed?

A Amerada Petroleum Corporation, San Ma, Texas Company, Shell Oil Company, Ohio, Sunray Midcontinent, Gulf Oil Corporation, Stanolind Oil and Gas Company, Anderson Prichard Oil, Tide Water Associated Oil Company.

Q To the best of your knowledge, are those all of the offset operators and leasehold owners within one half mile of the State "A" No. 2 Well involved?

A That is my understanding.

Q Now, sir, would you read the letter?

A Letter dated August 6, 1956, and was addressed to the above companies, "By the attached copies of Humble Oil and Refining Company's letter of August 3, 1956, --" which, parenthetically, was our application to the Commission," -- notice is given to the offset lease owners of Humble Oil and Refining Company's application for

an order granting permission to convert their State "A" No. 2 Well, Hobbs Pool, into a salt water disposal well."

Q Now, that letter was mailed to each of those companies at the address shown under your supervision on August 6?

A Yes, sir.

Q And have any of the letters been returned?

A We have had no response.

Q Now, one last question, in connection with this proposed casing operation, and drilling, assuming that it is done in a workman-like manner, should it prevent leakage of the salt water into potential producing horizons that you pass by?

A The reason for using 5-inch flush joint casing through the open hole section below the 7-inch casing and inside the 6 and a quarter inch hole which will be drilled, was to afford as much room as possible in the annular space to obtain a good cement seal. It is impossible, or almost, to test a cement job under these circumstances where, to know definitely that the cement job is effective and segregating two formations. However, where it is anticipated that suitable porous zone, permeable zone may be at considerable depth below the current productive oil and gas productive interval in the San Andres, this depth will afford additional insurance that somewhere between that depth and the bottom of the productive permeability in the Hobbs Field that a cement field may be obtained.

Q Now, if the application is granted, Humble will file its notice of intention to commence its injection and include it and

file its monthly reports as required by the Commission?

A That is correct.

Q Now, in your application, Humble has asked for an alternative order to be allowed to inject the salt water either immediately below the oil-water table in the water zone of the Hobbs Pool, or below that depth, is that correct, sir?

A That is correct.

Q Why is that?

A As may be noted by the Exhibit on the cross section, the distance between the various wells used in this cross section was from one and a half to three miles, and the gamma ray electric logs were rather poor. For this reason, the tops on the Grayburg, San Andres, Lovington sand and the possible water zone, are somewhat hard for the geologist to identify with assurance, and the section that was shown below the Lovington sand lacks a very clear definition and was rather difficult, for that reason to forecast ahead of time whether a permeable zone may be obtained at a reasonable depth below the Hobbs Pool in which to use for water disposal.

Q In either event, the zone of permeability now supplying the water to the Hobbs Pool below the water-oil contact would be the shallowest point of injection?

A That's correct. And if it were used, the water would be disposed of towards the base of that permeability supplying the Hobbs Pool with water currently.

Q Has this operation you are asking the Commission for permission

for been requested by you of any other State agency?

A The State Water Board and State Engineer in New Mexico has asked the cooperation of the New Mexico Oil and Gas Conservation Commission to obtain, through the operators, a voluntary water disposal program in the southeast Lea County, Hobbs has been mentioned as one of the more critical areas in which water needs to be disposed into some formation, and it is in response to, and in compliance with, the desire and wishes of the State Engineer, and I believe also the New Mexico Oil Conservation Commission, that Humble is taking this action.

MR. CHRISTY: I think that is all. For the record, there are no other operators involved in this salt injection project, and, of course, Humble's address is Houston 1, Texas.

A I would like to add one thing, that at completion of the State "A" 2 as a water disposal well, Humble will install a salt water disposal system to eliminate the use for surface pits. In the event any other operator or operators in the Hobbs Pool desires to use the salt water gathering system and State "A" 2 water disposal well, Humble is ready and willing to negotiate with them looking toward a cooperative water disposal project.

MR. NUTTER: Does anyone have any questions of the witness?

QUESTIONS BY MR. COOLEY:

Q Mr. Dewey, is it your professional opinion that the casing system and methods used in completing this water disposal system adequately protect all horizons productive of oil and gas and fresh

water?

A You can't assure that because every once in a while we run into a cementing failure that it is hard to account for. I think it has a very reasonable chance of preventing any migration of water from the point at which we intend to inject the water into all other zones. Of course, the only zone which seems to be threatened at all might be the zone that is now productive of oil and water in Hobbs Pool, that is the lower zone.

Q There would be no danger at all in your opinion to fresh water?

A I think at this depth and due to the fact that the casing will be cemented to the surface, that all the potable water zones will be adequately protected.

MR. COOLEY: That is all.

QUESTIONS BY MR. NUTTER:

Q This injection zone is well below the fresh water zones, isn't it, Mr. Dewey?

A Yes, it's way below, I think it's in a formation that the Board of Water Engineers has approved for injection purposes. I think they consider the injection into this zone to be so far below the potable waters that it would be safe to inject there.

Q So the only possibility of contamination would be through leakage through the pipe --

A Leakage through --

Q -- or the cement job?

A Yes, sir.

Q But you plan to use new five and a half inch, or five inch

flush joint?

A It would be flush joint at least through the open hole. After we get up into the seven inch and larger size holes, there would be more room to cement the casing.

Q And it would be cemented to the surface?

A It would be cemented to the surface, it might require two to do that, but we will cement it back.

Q Now, the water-oil contact that you have depicted on this Exhibit is at 4,277; I presume that is the water-oil contact as determined in the School of Mines Bulletin 18?

A Yes, sir, that is where that oil-water contact was determined.

Q Is it your personal opinion that the oil-water contact has risen?

A Oh, yes, very definitely so in this particular well, because the well was flooded out and abandoned due to the water table having come up in this individual well. It flooded out the oil productive section in the well.

MR. NUTTER: Does anyone else have a question of the witness?
If not, --

QUESTIONS BY MR. REEDER:

Q Do you plan to use the casing for injection, or are you going to tube it?

A We haven't discussed that matter, but I could see no reason to use the casing. It depends, I think, somewhat on the volume of water that eventually might be disposed of in this well and the

difficulty we might have in having to force it into the permeability. Now, the permeability is entirely an unknown factor and it may require pump pressure to put it in, and on the other hand, it might go in under a vacuum; if it went in under a vacuum, I could see no reason to use tubing, no advantage to it.

Q But you would consider it if necessary?

A If necessary, we would, yes, and a packer. Of course, that would restrict the volume of water that might be disposed of.

MR. NUTTER: Does anyone else have any questions of Mr. Dewey? If not, he may be excused.

MR. CHRISTY: Humble would like to offer into evidence the cross section map which Mr. Dewey has testified to. Mr. Dewey, do you have another copy of that letter:

A No, we can just leave that.

MR. CHRISTY: And we would like to also offer into evidence a copy of the letter of August 6 to the offsetting leasehold owners.

MR. NUTTER: Does anyone else have a statement they wish to make in this case? We have a telegram from Stanolind Oil and Gas Company which I will read into the record. It's addressed from Roswell, New Mexico, dated September 24, at 12:07 P.M. addressed to the New Mexico Oil Conservation Commission, Santa Fe, New Mexico. "THE APPLICATION OF HUMBLE OIL AND REFINING COMPANY ON CASE 1137 TO DISPOSE OF PRODUCED SALT WATER BELOW THE OIL WATER CONTACT OF THE SAN ANDRES IN THE HOBBS POOL IS IN ACCORDANCE WITH THE AIMS OF THE OPERATORS IN THOSE FIELDS WHERE THE SURFACE DISPOSAL OF PRODUCED

