NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

REGISTER

HEARING DATE SEPTEMBER 8, 1965 TIME: 9 A.M.

| NAME: | REPRESENTING: | LOCATION: |
|---|---|---|
| Seaman G. Buell | Seth, Montgomery, F & H | Santa Fe |
| R N Miller | Tidewater Oil | Midland, Texas |
| L B Lindahl | " | " |
| Richard L. Trimble | Atlantic Refining Co. | Roswell |
| Nina Dahlgren | R W Byram | Santa Fe |
| Clarence E Hinkle | Atlantic | Roswell |
| A. E. Gray | State Eng. Off. | Santa Fe |

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

September 9, 1965

EXAMINER HEARING

IN THE MATTER OF: Tidewater Oil Company for approval of a unit agreement, Lea County, New Mexico. Applicant in the above-styled cause, seeks approval of the Justis-McKee Unit Area comprising 880 acres of Federal, State and fee lands in Township 25 South, Ranges 37 and 38 East, Lea County, New Mexico.

IN THE MATTER OF: Application of Tidewater Oil Company, for approval of a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a waterflood project in the Justis-McKee Unit Area by the injection of water into the Justis-McKee formation through five injection wells located in Sections 13, 24 and 25, Township 25 South, Range 37 East.

Case No. 3300 & 3301 (Consolidated.)

BEFORE:

Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The next case will be Case 3300. The application of Tidewater Oil Company for approval of a unit agreement, Lea County, New Mexico.

MR. BUELL: Mr. Sumner G. Buell, Seth, Montgomery, Federici and Andrews, appearing on behalf of the applicant. At this time I would like to move to consolidate Cases 3300 and 3301.

MR. UTZ: Cases 3300 and 3301 will be consolidated for the purpose of testimony, but separate orders will be written on each case.

MR. BUELL: I have two witnesses, Mr. Lindahl and Mr. Miller, and we ask that they be sworn.

(Witnesses sworn.)

LARRY B. LINDAHL called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Would you state your name, by whom you are employed, and in what capacity?

A My name is Larry Lindahl, with Tidewater Oil Company. I am employed as a land man.

Q Are you familiar with the application filed in this Case Number 3300?

A Yes, I am.

Q Will you explain what is sought by this application?

A Tidewater seeks approval of a unit agreement of the Justice-McKee Unit Area comprising 880 acres of Federal, State and fee lands which is centered around Section 24, Township 25 South, RAnge 37 East.

Q What is the purpose of this proposed unit?

A The purpose of this unit is to unitize these lands for secondary recovery operation.

(Whereupon, Applicant's Exhibit No. 1 marked for identification.)

Q Referring you now to what has been marked as Exhibit 1, would you explain what it is?

A This is a bound copy of the combination unit and unit operating agreement which will be used in this unitization.

Q Referring you to Exhibit A of Exhibit 1, what does that show?

A Exhibit A of the Unit Agreement is a plat showing the acreage involved in this unitization, and it is distinguished by the cross-hatched outline around it. It shows the fee tracts, State tracts and Federal tracts and also the tract numbers which are indicated by a number with a circle around it.

Q Are those tract numbers carried over from Exhibit A to Exhibit B?

A Yes, they are.

Q Referring you now to Exhibit B of Exhibit 1, what does

that show?

A Exhibit B, Part 1, is the schedule of ownership. It indicates the tract number which is carried from the preceding plat. It shows the number of acres, the basic royalty owners, the lessees of record, the overriding royalty owners and percentages, and the working interest owners and percentages, and the phase 1 and phase 2 participation.

Q Is Part 2 of Exhibit B, Exhibit 1 a recapitulation.

A Yes, it is. Exhibit B, Part 2, is a recapitulation of the working interest ownership.

Q What percentage of your working interest to this proposed unit has ratified the unit agreement?

A One hundred percent of the working interest has ratified the agreement.

Q And as to the royalty interest and overriding royalty interests, where do you stand on securing approval of those persons?

A Throughout the entire unit area, we have an average commitment of 98.34 percent. This is taking into consideration the preliminary approval that was granted by the State and U. S. G. S.

Q Who will operate this unit?

A Tidewater will be the unit operator.

Q And who are the larger percentage holders of the

working interest?

A Tidewater will have approximately 53 percent while Gulf and Texaco are the largest working interest owners.

Q What is the general form of this unit agreement?

A The form of this unit agreement is one that is generally used in the industry and it's patterned after other agreements that have been approved, that Tidewater operates.

Q What formation do you seek to unitize?

A We are seeking to unitize the McKee formation which is found between the depths of 7,311 feet and 7,446 feet.

Q And on what basis will the various interest owners participate, what formula is to be used?

A The participation under the unit agreement is a split type formula. Phase 1, or the primary interest will be based on 100 percent of the total income from oil and gas produced from the period of January 1, 1964 to March 1, 1964.

Phase 2, or the secondary phase will be based on 50 percent of the accumulative oil produced to November 1, 1962, plus 50 percent of the accumulative oil produced to March 1, 1964. Phase 1 is to remain in effect until an accumulative total of 319,000 barrels are produced after November 1, 1962.

Q Do you anticipate any problems in the various tracts qualified for this unit?

A We do not. Each tract is now qualified under the

terms of the unit agreement.

MR. BUELL: At this time, Mr. Examiner, I would like to offer into evidence, Exhibit Number 1 in Case 3300.

MR. UTZ: Without objection Exhibit Number 1 will be entered into the record of this case.

(Whereupon, Applicant's Exhibit 1 was entered in evidence.)

MR. BUELL: I have no further questions.

MR. UTZ: Are there any questions of this witness?

MR. BUELL: May the witness be excused?

MR. UTZ: Yes, if you are through with this case, the witness may be excused.

(Witness excused.)

* * * * * * * *

ROBERT N. MILLER, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Would you state your name, please?

A Robert N. Miller.

Q By whom are you employed and in what capacity?

A Tidewater Oil Company, as district engineer in Midland, Texas.

Q Have you previously testified before this Commission?

A Yes, I have.

Q And have your qualifications been accepted by this Commission?

A Yes, they have.

Q Are you familiar with Tidewater's application in Case 3301?

A Yes, sir, I am.

Q Would you briefly state what is sought in this application?

A Yes, sir. Tidewater Oil Company seeks permission to institute a waterflood project in the Justis-McKee Unit Area by injection of water into the McKee formation through five injection wells located in Sections 13, 24 and 25, Township 25 South, Range 37 East, Lea County, New Mexico.

(Whereupon, Applicant's Exhibit 1, Case 3301, marked for identification.)

Q Mr. Miller, referring you now to what has been marked as Exhibit 1, would you briefly state and identify what it shows?

A Yes, sir. This is an exhibit in the general area of the Justis-McKee Unit. It shows the wells and completion intervals with a legend by letter within a two-mile radius of each proposed injection well. The unit area is shown by a dotted line centered around Section 24, 25 South and 37 East. Four existing wells that will be converted to injection

service are shown by red circles with a blue center. A proposed well for injection, located in the southeast quarter of the northwest of Section 24, is shown by a red circle with a white center. This is in the unit area, the Justis-McKee Unit area.

(Whereupon, Applicant's Exhibit 2 marked for identification.)

Q Referring you now to what has been marked as Exhibit 2, would you explain what this exhibit shows?

A Yes, sir. This is an enlarged portion of the unit area, it's a structure map of the Justis-McKee Field, and shows the structure to be an anticline flanked on the east by a fault. The tract number shown corresponds with that in the unit agreement previously presented. The proposed injection wells being requested are shown in red circles with blue centers. The proposed well for drilling is shown as a red circle with a white center. The gas-oil contact is shown to be about 4,065 feet subsea, and the oil-water contact at 4,620 feet subsea.

(Whereupon, Applicant's Exhibit 3 marked for identification.)

Q Referring you now to what has been marked as Exhibit 3, what does that show?

A This is the production history of the Justis-McKee Unit Area showing the monthly production, the number of

producing wells and accumulative production. At the present time there are twelve producing wells in the Justis-McKee Field with an average per well production of ten barrels per day per well, with a monthly rate for the field of approximately 3,600 barrels. Accumulative production for the unit area has been 1,200,000 barrels, and the field is approximately 90 percent depleted.

(Whereupon, Applicant's Exhibit 4 marked for identification.)

Q Mr. Miller, referring you now to what has been marked as Exhibit Number 4, what does that show?

A That is a west to east cross section across the unit area, showing the continuity of the pay. It shows the top of the McKee and the three zones into which we divide the McKee formation. Exhibit 4 also shows the gas-oil contact at a subsea depth of 4,065 feet and the oil-water contact at a subsea depth of 4,620 feet.

(Whereupon, Applicant's Exhibit 5 marked for identification.)

Q Referring to Exhibit 5, is that also a cross section? Would you explain what that shows?

A Yes, sir, a north to south cross section across the unit area again showing the continuity of pay in the unit area; it shows the gas-oil contact at 4,065 subsea and the oil-water contact, and the division into three producing sections of

McKee formation.

Q Briefly, Mr. Miller, could you explain and outline the reservoir characteristics that are involved in McKee formation?

A Yes, sir. The McKee formation is a silty sand. It has an average porosity of 16.2 percent and an average permeabilty of 50.7 millidarcies, and 55 percent connate water saturation.

Q What is the present reserve in percentage of the McKee zone, at this time?

A Based upon primary depletion methods this reservoir will produce 15.4 percent of the oil in place; by secondary it will be increased to 44.3 percent total, or 28.9 percent would be produced under water injection.

Q How many barrels is that, approximately?

A 2.6 million barrels.

Q And how long do you expect it to take to start production under secondary recovery methods?

A We will start our injection as soon as the approval of the Commission and the Federal Government is received, around December or January the 1st, and it would require about 18 months to receive the first response. The overall life of the project is anticipated at nine years.

Q And what will you inject into this, into the McKee

formation?

A Water.

Q And where are you going to get the water required?

A It will be from the Rustler formation.

Q And how much water will you require?

A Extraneous water requirements about, approximately 7,000,000 barrels, and total injection including the recycling of produced water will make about 9,000,000 barrels.

Q And how much water will you inject per day into the formation?

A Initially we will inject about 5,160 barrels through five injection wells, until we have injected for approximately two years; then the rates will be reduced to 1,650 barrels a day to match withdrawals and withdrawals will be matched during the entire life of the project.

Q What pressure will this water be injected at?

A At approximately 1,300 pounds maximum, sir.

Q Where is the well located that will supply the water for the formation?

A The well is located approximately 2,700 feet from the south line and 1,370 feet from the west line of Section 24, Township 25 South, Range 37 East.

MR. UTZ: Is that marked on your Exhibit 1?

A It's marked on Exhibit Number 2 by a small triangle,

almost in the center of the west half of Section 24.

Q At what depth will you be producing this water in your water well?

A From approximately 800 feet.

Q As you stated earlier, that is the Rustler, that is the Rustler formation?

A Yes, sir.

(Whereupon, Applicant's Exhibit No. 6 marked for identification.)

Q Mr. Miller, referring to what has been marked as Exhibit 6, would you explain what that shows?

A Yes, sir. It's a water analysis by Martin Water Laboratory, of the Coates "C" water well. It shows at the bottom the estimated yearly water requirements, the total water requirements, and the range of injection pressure anticipated over the life of the project.

Q Looking at this water analysis, is there anything that you can tell as to quality of the water?

A It appears to be a hard water and has 466 parts per million of sodium chloride.

Q Do you anticipate any problems of compatibility with the McKee water?

A No, sir, we have conducted compatibility tests with the McKee water and the water shown on the analysis, and it's

compatible in all respects.

Q Have you run any logs on this well?

A No, sir. We have a sample log for this well that was drilled with cable tools, and that has been furnished for the State Water Engineer in Roswell and Santa Fe.

(Whereupon, Applicant's Exhibit No. 7 marked for identification.)

Q Referring to what has been marked as Exhibit Number 7, would you tell the Examiner what is on the tabulation?

A Yes, sir. This is a tabulation of the four existing wells which will be used for water injection service and the proposed new wells. The completion dates of the initial four wells now existing is from late '57 to the middle of '59. It shows the amount of pipe set and the size of the surface, intermediate and production casing, the amount of cement used, and the top of the cement, the current producing interval and its perforations, and the proposed McKee injection interval. This well log has been previously furnished the Commission and the State Engineer on these four existing wells.

(Whereupon, Applicant's Exhibit No. 8 through 12 marked for identification.)

Q Mr. Miller, Exhibits 8, 9, 10, 11 and 12 have been marked, referring now to those, would you explain what Exhibit Number 8 shows?

A Exhibit Number 8 is a diagramatic sketch of Gulf

McBuffington Well Number 12. It shows the present condition of the well and the way the well will be recompleted as a Blinebry producer and McKee water injector. You will notice that injection will be beneath the packer and the equipment will be corrosion resistant equipment, plus plastic coated for protection.

Q What is the character of the present production in the Blinebry?

A It's a sweet oil.

Q This sketch is of one of the wells you propose to inject water into the McKee formation?

A Yes, sir.

Q Would you explain Exhibit 9 also, please?

A Exhibit Number 9 is a diagramatic sketch of the dual Gulf McBuffington Number 4, also a proposed injection well. The diagram on the left shows the existing status of the well and the diagram on the right shows the way that it will be recompleted as a dual Blinebry-McKee injector. Here again injection will be beneath the packer through plastic coated tubing.

Q Referring you to Exhibit 10, would you explain that, please?

A Exhibit 10 is a downhole profile of the Coates "D" Number 3, also proposed for injection. The sketch on the right shows how it will be recompleted as a Blinebry producer-McKee

injector. Here again, beneath the packer through the tubing.

Q And Exhibit 11?

A Exhibit 11 is Atlantic State "Y" Number 4. On the left it shows it to be a McKee completion not in operation. On the right it shows how it will be recompleted as a McKee injection well, showing the additional perforations required, and here again injection will be beneath the packer through plastic coated tubing.

Q And Exhibit 12?

A Exhibit 12 is the proposed injection well that will be drilled in the southeast quarter of the northwest quarter of Section 24. This shows the proposed program and how this well will be completed for injection service. Here again, being beneath the packer through plastic coated tubing.

Q On all the proposed injection wells, will the injection of water be below a packer?

A Yes.

Q And the packer is set below the top of the cement?

A Yes, sir, in all cases.

Q Were Exhibits 1 through 12 prepared by you or under your supervision?

A Yes, sir, they were.

Q Mr. Miller, in your opinion, will the proposed water flood project prevent waste and protect correlative rights?



A Yes, sir, it will.

MR. BUELL: At this time I would like to offer in evidence Exhibits 1 through 12.

MR. UTZ: Without objection Exhibits 1 through 12 will be entered into the record of this case.

(Whereupon, Exhibits 1 through 12 were entered in evidence.)

MR. BUELL: I have no further questions of this witness.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Miller, this would be considered a peripheral type flood, is that correct?

A Yes, that is correct.

Q On your completion methods you state here on your downhole profiles that the two and three-eighths-inch tubing is plastic coated?

A Yes, sir.

Q Is that plastic coated on both sides, or just internally?

A Just internally.

Q How about the possibility of corrosion below the packer from the outside of the tubing?

A On the outside of the tubing, below the packer?

Q Yes.

A We do not actually anticipate it in the area of the packer itself. That will be plastic coated and there will be very little tailpipe that will be set through the packer.

Q Well, nevertheless, you will have bare steel going up through the inside of the plastic caoted packer, won't you?

A Well, your seal ring is going through your packer, this is a Model "D" packer, and it has your seal ring that will go thorugh and seal in the packer and the amount of tubing that will be below the packer will not exceed over 24 feet; and your injection will be down at that point. Now, you would have a dead stage in there that will be filled with fluid up to the bottom of your packer. Since that would not be active flood, we would not anticipate an appreciable amount could be run through the packer. Whether or not you had a good job on the outside would be subject to question.

Q And your injection producer wells, how about the Blinebry oil, what affect will it have on the exterior of your injection tubing?

A The Blinebry oil, to my knowledge, has shown no corrosion problems through its fill out there. Now, there are numerous Blinebry wells out there, but we would anticipate no particular corrosion problem from the outside in from the Blinebry production. I believe rather than saying it was a sweet oil, it will be classified as intermediate by the Texas-New Mexico

Pipeline Company, and is commingled with the McKee and Ellenburger and Montoya in the commercial batteries in that general area.

Q On the wells that you don't intend to produce from the Blinebry do you have intentions of flooding it beneath with an inner-flood around the field?

A Well, probably, if you have a packer in there, that would be inhibited brine or inhibited fresh water, as a packer flood, yes, sir.

Q Now, referring to your Exhibit 3, do I interpret this as now having twelve producing wells?

A Yes, sir, it now has 15 wells in the McKee, 12 of which are currently producing.

Q And what is the rate of production of all 12 of those wells?

A Roughly, 3,600 barrels per month.

Q So that would be an average of 300 barrels per month apiece, right?

A Yes, sir, ten barrels per day per well.

Q Would you give me the formation characteristics again, your porosity, permeability and water?

A Yes, sir. The porosity of the McKee averages 16.2 percent; permeability, 50.7 millidarcies; and the water saturation, 55 percent.

MR. UTZ: Are there other questions of the witness? Is the State Engineer completely satisfied with it?

MR. GRAY: I believe so, Mr. Examiner. I don't believe the State Engineers would offer any objection to this waterflood.

MR. UTZ: If there are no further questions the witness may be excused.

MR. BUELL: We have nothing further in either case.

(Witness excused.)

MR. UTZ: Are there any other statements to be made in this case, these cases? The case will be taken under advisement.



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

I, _____, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner 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 _____ day of _____, 1965.

_____
Notary Public, Court Reporter

My Commission Expires:

_____

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3300-3301 heard by me on 9-8, 1965.

_____, Examiner
New Mexico Oil Conservation Commission