BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 26, 1968

EXAMINER HEARING

IN THE MATTER OF: Application of Tenneco Oil Company for a unit agreement, Lea County, New Mexico	CASE NUMBER 3789
IN THE MATTER OF: Application of Tenneco Oil Company for a waterflood project, Lea County, New Mexico.	CASE NUMBER 3790

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3789.

MR. HATCH: Case 3789, application of Tenneco Oil Company for a unit agreement, Lea County, New Mexico.

MR. KELLY: Booker Kelly on behalf of the applicant. Mr. Examiner, this we would ask be consolidated with the next case, which is the application for waterflood on the same unit, 3790, as far as testimony, at least.

MR. UTZ: Cases 3789 and 3790 will be consolidated for the purposes of testimony. Separate orders will be written on each case, however.

(Whereupon, Exhibit Numbers 1-3 in Case 3789 and Exhibit Numbers 1-9 in Case 3790 were marked for identification.)

MR. UTZ: Are there any other appearances? You may proceed.

MR. HATCH: I don't think the witness has been sworn yet.

(Witness sworn.)

WALTER PALMER

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, position and employer,

please?

A My name is Walter Palmer. I am employed by Tenneco Oil Company as petroleum engineer.

Q Have you previously testified before this Commission as an expert witness as a petroleum engineer?

A I have.

Q Would you state briefly what Tenneco seeks by the application in Case Number 3789 Unit Agreement Application?

A Tenneco seeks approval of the Mesa Queen Unit Agreement uniting approximately 1,040 acres of State lands, located in Township 16 South, Range 32 East, Mesa Queen Pool, Lea County, New Mexico.

Q Exhibit 1 is a copy of the proposed unit agreement, is that right?

A That's correct.

Q Attached to Exhibit 1 and marked Exhibit "A" is a plat of the proposed unit, is that correct?

A That is correct.

MR. KELLY: Mr. Examiner, that's at the back of the proposed unit agreement. It's marked Exhibit "A" to the agreement.

Q Attached right back of that is the legal description of the unit, is that right?

A That's correct.

Q Does this also show all the operators and royalty interest owners?

A It does.

Q Now, does this unit agreement, is this the same unit agreement that has been submitted to all operators of royalty interest owners in the pool?

A Yes.

Q Would you describe this as the basically standard unit agreement that has previously been approved by this Commission?

A It is a standard agreement as to form.

Q Going on to Exhibit Number 2, which is your list of sign-up, would you go through that with the Examiner?

A Exhibit 2 shows the status of the sign-up at the present time. We have received written approval from working interest ownership of approximately fifty-three per cent of the working interest owners and verbal approval from forty per cent, no reply from approximately seven per cent. By verbal approval, I mean that the working interest owners have told us that approval of the unit agreement is imminent.

Q So, you have a pretty definite agreement on over ninety per cent of the working interest owners, is that right?

A That is correct.

Q Do you anticipate that you will have any nonsigners?

A I don't at the present time. I'm not sure, though.

Q Is this all State land?

A Yes, it is.

Q How have you done on your sign-up of royalty ownership?

A Approval has been assumed from sixty-five per cent of the total royalty which includes the State land ownership. Written approval has been received from two per cent of the total royalty and no reply from thirty-three per cent.

Q Now, Exhibit Number 3 is a letter from the Commissioner of Public Lands, giving preliminary approval to this unit agreement, is that right?

A That is correct.

Q Has the final draft been submitted to the Commissioner of Public Lands?

A Yes, it has.

Q What formations will be unitized under this agreement?

A The formation that will be unitized is described on Page 2-D, I believe it is, in the unit agreement, and the wording goes as follows:

"In the Tenneco Oil Company Sinclair State Well

Number 2, that interval of the Queen Sand 100 feet above the top of the Queen Sand and 100 feet below the base of the Queen Sand, said Queen Sand interval occurring between 3389 feet and 3420 feet."

Q Could you locate that well which was used for your unitized area on the plat, Exhibit Number 1?

A Perhaps on Exhibit "A" here.

Q Yes.

A That is the Sinclair State Well Number 2, 660 feet from the east line and 660 feet from the north line of Section 16. It's in the upper right-hand corner of the unit.

MR. UTZ: You mean that dry hole?

THE WITNESS No, sir.

MR. UTZ: Upper right-hand corner?

THE WITNESS: Upper right-hand corner.

MR. UTZ: Okay.

Q (By Mr. Kelly) Is this unit formed for secondary recovery purposes?

A Yes.

Q In your opinion, is the whole unit productive of oil and gas?

A It is.

Q In fact, there are presently producing wells that

cover the Mesa Queen over the whole unit?

A That's right.

Q In your opinion, would the granting of this application prevent waste by allowing production of secondary recovery and protect the correlative rights of all parties involved?

A Yes.

MR. KELLY: Mr. Examiner, do you have any questions as to the unit agreement phase of this testimony?

MR. UTZ: I have no questions on the unit agreement.

Q (By Mr. Kelly) Is Exhibit 1 a true copy of the proposed unit agreement?

A It is a true copy.

Q Exhibit 3 is a true copy of the letter received by Tenneco from the Commissioner of Public Lands?

A That is correct.

MR. KELLY: I would move the introduction of Exhibits 1 through 3 at this time.

MR. UTZ: Exhibits 1 to 3 will be entered into the record of this case.

(Whereupon, Exhibits Numbers 1-3 in Case 3789 were offered and admitted in evidence.)

Q (By Mr. Kelly) Now, going on to the second Case

3790, would you briefly state what Tenneco seeks by this application?

A Tenneco seeks approval of a waterflood project for secondary purposes in the Mesa Queen Unit Area by injection of water into the Queen formation through twelve wells in Sections 16, 17 and 20, Township 16 South, Range 32 East in Lea County.

Q Now, referring to what has been marked Exhibit 1 to this hearing, a plat of the area, would you explain that to the Examiner, showing the proposed project area?

A Exhibit 1 is a map showing the wells within a two-mile radius of the proposed Mesa Queen Unit. Also shown are the producing zones of all wells in different colors. The boundary of the proposed unit is shown in the crosshatched line around the unit. Those wells that we propose to convert to injection in the unit are shown by a small triangle around the well.

We propose to inject into all the upstructure wells in order to create a limited water barrier to prevent migration of oil into the gas cap when we inject water downstructure.

You'll notice that every other downstructure well has been converted to water injection. The oil will be withdrawn from this center line of wells.

Q How many injection wells and production wells do you have on there?

A There will be twelve injection wells and twelve producing wells.

MR. UTZ: The gas cap is to the northwest, then?

THE WITNESS: That's correct. You'll notice the several gas wells to the northwest which are completed in the same Queen Sand interval, but in the gas cap of the reservoir.

Q (By Mr. Kelly) All the wells in the unit area are classified as oil wells?

A Yes.

Q Then does the plat also show all offset operators within the two-mile radius?

A It does.

Q Now, going on to what has been marked Exhibit 2, which is a structure map, --

MR. KELLY: Mr. Examiner, that is on the back, the insert in the back.

Q -- would you explain that to the Examiner?

A Exhibit 2 is a structure map contoured on five-foot intervals on the top of Zone 1 on the Queen Sand. Also shown is the limit of Queen Sand permeability around the field with that line with the little dashes on it. This shows the

relationship structurally of the gas wells and the oil wells.

I might call your attention to the red line which is the cross-section that will be presented in the next exhibit, the line of cross-section. That's all that I have on that.

Q Go on to Exhibit Number 3, which is your cross-section.

A Exhibit Number 3 is a cross-section through that red line that I mentioned on the structure map. Shown in blue is the underlying water downstructure. Shown in green are the two main zones of oil porosity and shown in yellow is the overlying gas cap.

Q Anything else you want to mention on that?

A No.

MR. UTZ: Does this indicate that this pool is water drive from the south or is that just a water table?

THE WITNESS: It's just a water table. It's not active.

Q (By Mr. Kelly) Now, on Exhibit 4, you show the pertinent data that pertains to this field. Will you go over that briefly?

A Exhibit 4 is a tabulation of the pertinent reservoir information, such as depth, average porosity and average permeability and pressures in the field. Also are presented

the current oil, gas and water production, et cetera. I believe it's self-explanatory unless there are any questions.

Q I notice your figure for original oil in place is possibly a little optimistic in the light of your production history, is that right?

A Original oil in place to the best figure, using good engineering methods of counting pay and plenimetering, is 11,300,000 barrels. Primary depletion has been a little over 7,000 barrels which is a little less than seven per cent of the calculated oil in place. We suspect that there's something wrong with the volumetric figure, but we are unable to explain this low recovery.

Q Do you feel that the primary production has been just about exhausted?

A Yes. Most of the wells are now below the economic limit.

Q Are any of the wells in the unit area capable of top allowable?

A No.

Q What is your average production on those wells now?

A Oh, less than two barrels a day per well. There are two wells that are making twenty to thirty barrels a day, still, but they are the only ones.

MR. UTZ: The average reservoir pressure now is 100 pounds?

THE WITNESS: That's an estimated extrapolated reservoir pressure, yes, sir.

MR. PORTER: What percentage of recovery would you ordinarily expect from this type reservoir?

THE WITNESS: Fifteen per cent; that is an average I would estimate for this type of sand.

Q (By Mr. Kelly) Going on to Exhibit Number 5, your tabulation of production history, is this for the unit or for the whole field?

A This is a tabulation of production history from the whole field taken from the Corporation Commission records.

Q What do you have, about four gas wells outside the unit?

A Yes. Those wells are included in the gas-oil ratio and the gas production.

Q Then you have the same information shown on performance curves on Exhibits 6 and 7, is that correct?

A That is correct. Exhibit 6 is a graph of the oil and water production by months; and the Exhibit 7 is a graph of the gas and the gas-oil ratio.

Q Actually, the gas-oil ratio shown on Exhibit 7 is

misleading if taken only for the unit area, is that correct?

A That is correct, because that gas-oil ratio includes the gas production from the gas wells.

Q What would be the estimate of the average gas-oil ratio for the wells in the unit?

A I would estimate from 1,000 to 2,000 cubic feet per barrel.

Q What would you expect to recover on your secondary recovery project in relation to your primary production?

A We anticipate at least as much secondary as we have produced primary. Hopefully, a lot more because of the low primary production.

Q In your opinion, the wells in the proposed project area have reached their economic limit?

A Yes, they have.

Q Now, what volume of water will you be injecting into these wells?

A We anticipate in the upstructure wells from five to six hundred barrels per day and a pressure of approximately 1500 pounds per square inch.

MR. UTZ: How much per day?

THE WITNESS: Five to six hundred barrels per day per well in the upstructure injectors. Downstructure injectors

would be probably slightly less.

Q (By Mr. Kelly) What were the figures?

A 1500 plus or minus pounds per square inch.

Q Did you tell the Examiner the drive mechanism of this reservoir?

A Predominantly solution gas drive.

MR. UTZ: Gas cap assists, does it not?

THE WITNESS: I don't think the gas cap is assisting very substantially because of the low pressure that we have found, and the low recoveries it could be contributing a little.

MR. UTZ: Your pressure is substantially higher in the gas cap?

THE WITNESS: No, I don't believe it is. This is open to conjecture because of the large size of the gas cap. There is some difference in the pressure in the gas wells that are far upstructure. They have considerably higher pressure, but the nearby gas wells have, I believe, similar pressure to the oil field, although I was unable to obtain any pressure data on those gas wells.

Q (By Mr. Kelly) Going on to Exhibit Number 8, which is a sketch of one of the injection wells, would you first locate the well that this sketch shows?

A Referring to Exhibit 1, this well is located 990

feet from the north line and 2310 feet from the west line of Section 16. It is that well that is shown as a gas well in Section 16, the northeast quarter of the northwest quarter.

Q Is this diagrammatic sketch typical of the installation that will be used for all twelve of the injection wells?

A Yes. This sketch is representative of all the other, all the wells that we propose to convert to injection.

Q Would you go through the proposed installation and explain it to the Examiner?

A We propose to -- first of all, I'll go through the original completion of these wells. The eight-and-five-eighths-inch casing was cemented to surface at approximately 388 feet, the well was drilled to T.D.

Four-and-a-half-inch casing was then run and cemented with 125 sacks and estimated top of that cement came up to 2500 feet. The well was perforated and completed.

We intend to convert the well to injection by injecting below a casing packer, injecting down two-and-three-eighths-inch plastic-coated tubing, filling the annulus with corrosion-inhibited fluid and observing the casing annulus at the surface to detect any leaks or installing a pressure gauge.

Q Are all the wells single completions?

A Yes. There are no dual completions in the field.

Q And the perforations are only in the Mesa Queen?

A That's right.

MR. KEELY: Mr. Examiner, we can furnish sketches of the other wells if you like. I didn't know if you wanted the record filled with another eleven exhibits or not.

MR. UTZ: Well, are all the other wells completed in this manner, --

THE WITNESS: Yes, sir.

MR. UTZ: -- substantially?

THE WITNESS: Substantially they are all the same.

MR. UTZ: And they were all completed approximately at the same time. You don't have any real old wells in this pool?

THE WITNESS: No, sir.

MR. UTZ: And you would state that the cementing is adequate in all other wells?

THE WITNESS: Yes.

MR. UTZ: I don't believe it would be necessary, do you?

MR. KELLY: We have them if you want them.

MR. HATCH: I think it would be better if you would leave them.

MR. UTZ: You do have them with you?

MR. KELLY: Yes, we brought them.

MR. UTZ: I think it would be a good idea to leave them.

THE WITNESS: Here's one complete set. We have extra copies if they are needed.

(Whereupon, Exhibit Number 10 in Case 3790 was marked for identification.)

Q (By Mr. Kelly) What is the source of your water for the injection wells?

A We plan to purchase fresh water from Double Eagle Water Corporation of Roswell, New Mexico, which has a line about a half mile northwest of the proposed unit.

Q Do you also plan to inject produced water at a later date?

A Yes. We will reinject produced water.

Q You feel that the installations that you have shown will protect fresh water and prevent migration of fluids from any other zone?

A Yes.

Q And Exhibit 9 is a log of the injection wells, is that right?

A Exhibit 9 is a log of the same well that is shown in the schematic diagram for the completion of the injection

well. It shows where the perforations are in relationship to the gamma ray and sonic curves in the Queen formation.

Q Now, in your opinion, will the granting of this application allow Tenneco to prevent waste by producing oil and gas that would otherwise be left in place?

A It will.

Q Do you feel that the granting of the application will have any adverse effect on any correlative rights on the operators in the area?

A It will not.

Q Were Exhibits 1 through 10 prepared by you or under your supervision?

A Yes, sir.

MR. KELLY: That's all I have on direct. I would move the introduction of Exhibits 1 through 10. 10 includes twenty-four parts, a schematic and a diagram on each well to be converted.

MR. UTZ: Without objection the Exhibits 1 through 10 will be entered into the record of this case.

(Whereupon, Exhibits 1-10 in Case 3790 were offered and admitted in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q Do you show a list of twelve injection wells on

your exhibits anywhere with a detailed description? I didn't notice it. You do have it in your application?

A A detailed description of the location.

Q Of the location and proper name for each well?

A Yes, I believe that was submitted with the application.

MR. KELLY: It is with the application.

Q (By Mr. Utz) The application is correct for all wells?

A Yes, sir.

Q Now, as to the operator of these wells, do you wish to leave the old operator names on all these wells or will Tenneco be the operator of all of them?

A Tenneco will operate the unit. We'll probably retain the names of the wells as they are. I'm not sure of this, though. Sometimes they change the names when they unite, I believe.

Q Sometimes they do. Would you advise me of this as soon as possible, --

A Which way we intend to go.

Q -- so we'll have the names of the proper wells?

A Yes, I will. Otherwise, I think you can assume that they will remain as presented.

MR. KELLY: Why don't you just confirm it one way or the other?

THE WITNESS: Confirm it, all right.

Q (By Mr. Utz) Could you give me a call tomorrow?

A Yes, I would be happy to.

MR. UTZ: Are there any other questions of the witness? The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements in this case? We will take the cases under advisement.

I N D E X

E X H I B I T S

NUMBER	MARKED FOR IDENTIFICATION	OFFERED AND ADMITTED IN EVIDENCE
Exhibits 1-3 Case 3789	2	7
Exhibits 1-9 Case 3790	2	18
Exhibit 10	17	18

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 5th day of July, 1968.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1971

I do hereby certify that ... 3789 & 90
heard by me on June 26 6F
New Mexico Oil Conservation C...