BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 25, 1967

IN THE MATTER OF:	)	
	)	
Application of Ryder Scott Management Company for a waterflood expansion, waterflood buffer zone and several unorthodox locations, Eddy County, New Mexico	)	Case No. 3678
	)	

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The next case will be Case 3678.

MR. HATCH: Case 3678, Application of Ryder Scott Management Company for a waterflood expansion, waterflood buffer zone and several unorthodox locations, Eddy County, New Mexico.

MR. LOSEE: Jerry Losee. Mr. Examiner, A. J. Losee, Artesia, New Mexico, representing Ryder Scott Management Company. I have one witness, Mr. May.

(Witness sworn.)

D O N A L D T. M A Y, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. LOSEE:

Q Will you state your name, please?

A Donald T. May.

MR. UTZ: M-a-y?

THE WITNESS: M-a-y, yes, sir.

Q (By Mr. Losee) Where do you live, Mr. May?

A Muleshoe, Texas.

Q What's your occupation?

A Petroleum Engineering.

Q By whom are you employed or --

A Ryder Scott Management Company.

Q How long have you been so employed?

A With the Ryder Scott Management Company?

Q Yes.

A Three years.

Q You have no previously testified before the Oil Commission?

A I have not.

Q Where did you obtain your education, higher education?

A Carnegie Institute of Technology, Pittsburgh, Pennsylvania.

Q Did you graduate with a degree, and if so, what degree?

A Bachelor of Science degree in Chemistry.

Q What year was that, Mr. May?

A 1953.

Q Since that time in what occupation have you been?

A I joined the American Sheet and Tinplate from Ryder Scott Petroleum Engineers in July of 1953 and have been engaged in Petroleum Engineering work since that time.

Q During that period of time, have you been engaged in any waterflood project, and if so, approximately how many?

A Over 600 projects from completion to the end. From the start to the end.

Q Have you written any papers on the subject of waterflood?

A Yes, I have.

Q Could you tell us a couple of the papers you have written and where they have been published and by whom?

A I recently, about three years ago, I wrote one for the short course at Texas Tech, a short course, they call it, I guess, and that was on the problems involved in deep waterfloods. This one was about 6400 feet and it's published in their pamphlet they put out for that meeting. Prior to that I was co-author on a number of papers with Harry M. Ryder in the late 30's and through the 1940's. One I published personally in 1948 was Chip-coring Technique with the introduction of Reservoir Control and water injection.

MR. LOSEE: Are Mr. May's qualifications acceptable, Mr. Examiner?

MR. UTZ: There may be some questions as to whether 6400 waterfloods would qualify him. He's qualified.

(Whereupon, Applicant's Exhibits 1 through 7 were marked for identification)

Q (By Mr. Losee) Mr. May, please refer to what has been marked as Exhibit 1 and explain what is shown on that map.

A The area involved in this project is outlined in

red, covering the Mershon Lease, the Humble-State and the Humble-State A, the Vandeventer Lease, the Rotary State Lease and the Collier State Lease. The areas outlined in orange and green are the waterfloods that were developed by Grayrich, now owned by Fina. The pattern area is also outlined in a dark green, which connects the proposed conversions and the new injectors to be drilled. There's an orange line coming from Adkin-Williams through the Vandeventer No. 1, through Humble-State 1, and through the Mershon No. 3 which are the wells shown in our cross section. I believe that explains everything by colors on this map.

Q Let me ask for a little further explanation on this Collier acreage which description-wise is the south half of the northwest and the northeast of the northwest. That is acreage that you have at this point entered into an agreement with Collier to purchase and propose to take over as operator?

A That is correct.

Q Now, I am correct in saying that actually at this point 31 - 32 sections of the working interest has agreed to sell their interest to you? Now, calling your attention to what is shown as your Mershon Lease and actually the Humble Lease being the southwest, northeast of Section 20, and the west half, northwest of Section 21, that is included

within the red boundary, that area was actually authorized as a waterflood project in June and July of 1962, was it not?

A Yes, sir.

Q And the terms of that order authorized buffer zone treatment to that acreage, did it not?

A That is correct.

Q Now, the Fina project to the southeast, circled in green, is operating and has operated at capacity allowables, has it not?

A That is correct.

Q Would you also point out the locations of your three unorthodox injector wells, just by quarter sections?

A All right. The Vandeventer No. 2 is in the northwest quarter of the northeast of Section 20 and the two Rotary wells are in the northwest corner of the southeast of Section 20.

Q Those are -- actually the locations are ten feet out of the 16 section lines, are they not?

A That is right.

MR. UTZ: All of them are ten feet out of the corner?

THE WITNESS: Yes, sir.

MR. LOSEE: Yes, sir, in the 40's.

Q (By Mr. Losee) Could you tell the Examiner some of the history of some of the production in this Fina flood, both as to cumulative and average daily production of some of the wells?

A Some of these wells, I might state, have produced as high as 100,000 barrels of waterflood oil. They range anywhere from 12 to the highest I have here, is 100,350 barrels of oil which is the cumulative through November, 1966, the last figures I worked with. In figuring the peak, or do you want me to speak of the peak production?

Q Surely.

A I don't have it on the individual wells, I have an average figure. Figuring from the rate of peak production for the whole area, it showed that these wells reached, on an average, pretty close to 75 barrels of oil per day per well. I do know that several of these wells produce considerably more than that at a peak and several of them produced somewhat less than that, which would mean some of them were over a hundred barrels a day at the peak and some of them would be somewhat less than fifty.

MR. UTZ: When you are speaking of the whole area, what area are you speaking of here?

THE WITNESS: The Fina Flood No. 2 outlined in

green on this exhibit.

MR. UTZ: The Fina No. 3 is not a capacity flood?

THE WITNESS: Excuse me?

MR. UTZ: Is the Fina No. 3 a capacity flood?

THE WITNESS: Yes; it was not developed on as confined an injection pattern, as you can tell by the key to the wells and for that reason it did not peak as well as the Fina Flood No. 2.

MR. UTZ: Go ahead.

Q (By Mr. Losee) Please refer to what has been marked as Exhibit 2, and explain what this compilation reflects.

A In Exhibit No. 2, we show the production by months by wells on all the wells involved in this project area. On Humble-State No. 1 you will note that its production has been on an average up to the current time from that period, almost two barrels of oil per day per well, a little more and a little less through that whole period, which certainly shows the depletion of primary. Humble-State 2-A has had some water-flood stimulation after mid 1965, it will be noted it was making less than a barrel of oil per day at that time, and kept increasing until the current time. It's 1200 to 1500 barrels of oil per month. On Mershon No. 1, we had stimulation

there from the injection of the Mershon No. 3 and the Fina injection to the southeast which was started somewhat prior to the recording of this production by months, and our Mershon No. 1 from water injection, we have recovered over 50,000 barrels of oil from it as waterflood oil.

Mershon No. 2 also had some stimulation from the injection of Mershon No. 3.

MR. NUTTER: Excuse me, Mr. May, this response would have been prior to the time when this table starts, is that correct?

THE WITNESS: Yes.

MR. NUTTER: Would it have been back around 1962 or '63?

THE WITNESS: '62 or '63, that's right, there was some stimulation at that time. I see we have our Pyle No. 1 listed here, but that is not included in this area. It offsets up there. Rotary No. 4 showed it to be making in '64 less than 2 barrels per month, and you will note that in, starting about the middle of 1965, it began to show the stimulation and has increased in the early part of 1966, and is currently showing some climb.

This stimulation is mainly from water injection. Some of it could be from our Mershon, some of it could be from

the water injection on the Adkin-Williams Lease, the Sima Capitan, but there's some channeling trouble which we feel has caused us some current decline in this No. 4 Rotary. The No. 5 has had some stimulation also and it's main stimulation came in mid 1966. Currently it has declined some as you will note. Rotary No. 6, through all this period, has maintained almost constant production until almost mid 9-1967, when it's showing a drop-off there, too. Vandeventer No. 1 is almost 3 barrels of oil per day per well, In early '66 -- excuse me, let me correct that. In early '64, it was about a barrel of oil per day which showed primary depletion and then it received stimulation in the latter part of 1964 and continued to the first half of 1965 and then showed a little decline. Again we have a pick-up in the latter part of 1966 to the early part of 1967, which was better controlled water injection along the two wells that Sima Capitan puts water into on the north line of the project, their 1-W and No. 7. Is there any further explanation on that?

Q No, I think that's fine.

A We also have the total production from the three Collier wells, Amerada State No. 1, Western-Yates No. 1 and Western-Yates No. 2. From the first eight months in 1967,

you can see the total production there was just a little over 200 barrels per day per each well. That's less, somewhat less than a barrel of oil per day on the average per well and certainly indicates primary depletion.

Q Mr. May, before you turn to the portion of this exhibit referring to cumulative, do you have an opinion in the proposed expansion as to whether those wells before response, have reached a primary state of depletion?

A Yes, they have.

Q Go ahead.

A On the next page, we'll notice that the cumulative production by wells is reported. This cumulative for all the wells shows the period up to 1-1-64, 1-1-'65, 1-1-'66 and 1-1-'67, and to the current time of 9-1-'67. We'll note most of these wells were drilled between 1957 and '58, except the Mershon which was drilled in about 1950. The cumulative primary, for instance, Humble-State No. 1 is only 7,662 barrels, through up to 1-1-'64. As you go down that same column, Mershon-State has 44,892, a big portion of this oil is secondary or waterflood oil, and the same with Mershon State No. 2. Of course, Mershon-State No. 3 shows very little because it was converted to injection. Rotary State No. 4, that same period is 19,027 barrels. The State No. 53, no --

Rotary-State 7, 7,836 and Vandeventer State No. 1, 9,000 barrels. Through all these wells it shows that the primary has been rather low and if we take it up to 1-1-'67, or, let's take it to the last column and go through the same wells, Humble-State No. 1 only has 10,003 barrels of primary oil produced. Humble-State A-2, you will notice on the current production we show some stimulation there; and Mershon State No. 1 is up to 68,060 barrels. The big portion of that, as I said a while ago, we had to produce over 50,000 barrels of secondary oil, leaving that well with over 80,000 barrels of primary.

Mershon-State No. 2, a fair portion of it is water-flood oil that we have recovered there also. Now, in all, this indicates that the primary from these wells has been in the order of 10,000 to oh, 12,000 to 15,000 barrels of oil.

Q Mr. May do you have an opinion as to the amount of oil that will be recovered in this project by secondary recovery methods?

A Yes, I do. I have worked with this Fina Flood No. 2 to help make estimates. Their Flood No. 2, the Northern end of it, produced 310 barrels of oil per acre foot. The southern portion produced 360 barrels of oil per acre foot. Their spacing goes from 10 to 17 acres, included in the five-spots. Of course, that is somewhat shorter spacing than

we will be using. Our spacing will average 40 acres, a little better than that in the five-spot. The continuity of the Loco Hills Sand which is the upper zone is good on our area, as well as Fina Flood No. 2 which was the only zone they flooded and that was their rate of recovery. Due to our wider spacing, I figure we will take about two-thirds of the oil that they took per acre foot on account of the wider spacing, which I have allowed two hundred barrels of oil per acre foot that we have recovered by waterflood. In the area enclosed in our proposed pattern, we average four to six feet of waterflood pay in the Loco Hills, and recovering 200 barrels per acre foot means that we have about a thousand barrels per acre to be recovered by the 40 acres enclosed, which would be about 40,000 barrels per well from the Loco Hills Section only. The Me-Tex Premier and Lovington are somewhat tighter sands than the Loco Hills, and I have only given them half credit, as I have given to the Loco Hills, or about 100 barrels of oil per acre foot and the summation of the sands, Me-Tex Premier and Lovington, should give us about double the acre feet as we have from the Loco Hills alone, so those three zones should produce about the same amount of oil that we get from Loco Hills alone which is throwing us in the range of 80,000 barrels per well or better from each producing 40-acre

five-spot.

Q Please refer, Mr. May, to what has been marked as Exhibit 3, and without going into it, explain what is portrayed by that compilation.

A This is well data on every well in the project area. We show the Unit letter and section, the elevation of the wells, the date they were completed, the surface casing is recorded and the sacks with which it was cemented and also the production casing string, the size of the casing and its setting depth and the number of sacks used. The total depth of the well or the plugback total depth in the next column and under "treatment and remarks" we show how they were perforated and how they were fracked or acidized and some of them,whatever ones were completed openhole, they were shot with nitroglycerin and the zones in which they were shot.

Q Let me ask you, with respect to the Mershon-State No. 2, which is one of your proposed injectors: This data sheet shows no record of producting casing, Has later information caused you to revise that, and if so, do you know if there's any production casing set in the well?

A Yes, there is production string in that well. There's four and a half inch set at 2048, which is just at

the top of the Loco Hills section of sand.

Q Please refer to what has been marked as Exhibit 4, being your cross section.

A Yes.

Q And explain what is portrayed by the cross section, what wells?

A On Exhibit No. 1, I showed by an orange line how these wells were taken into the cross section going from the Sima Capitan or Adkins Well No. 1-W down through the Vandeventer No. 1 into the Humble-State No. 1 and into Mershon No. 3. This cross section shows the producing intervals only. There's no sale or structure consideration in laying out this cross section. It's just to show the relative thicknesses as you go from one well to well and which are the producing zones. As you go from left to right in this cross section, in the top of the heliotrope color, I've shown the pay of the Loco Hills zone and you can see it's rather consistent and we feel that this will work very well in view of Grayrich or Fina's experience in the zones they flooded on the Loco Hills.

Coming on down, you'll see the green, and it's labeled the Me-Tex zone. Through this area there are the main layers, there's some lessening, they will come and go, and that's the reason I discounted somewhat on the waterflood

recovery. In the red, I have posted what I call the upper Premier and then on down, I have posted the main Premier. Just which the main Premier comes above the top of the San Andres and lastly our, at the deepest point in the well, is the Lovington, indicated in yellow.

Q I think that's real fine. Refer to what has been marked as Exhibit 5, being the logs of the two proposed injectors that are presently drilled, being the producing intervals, at least.

MR. UTZ: Mr. Losee, I think we're going to be going here several more minutes. I think this would be a good time to recess for lunch unless you are in a big hurry to get home. We will recess until 1:30.

(Whereupon, a noon recess was taken.)

DIRECT EXAMINATION
(Continued)

MR. UTZ: The hearing will come to order. I believe you were beginning with Exhibit No. what?

MR. LOSEE: Five.

MR. UTZ: No. 5.

BY MR. LOSEE:

Q Being the logs of the two injection wells that are already drilled that you propose to convert, would you explain

what that exhibit portrays?

A This is Gamma Ray neutron log, the first one is on the Western-Yates Collier State No. 1, and here it's just to merely relate the zones that we are going to flood, Note the top zone is the Loco Hills which is in the Grayburg section colored in orange, and then there's a Me-Tex colored in green and on down and red is the main Premier and lastly at the bottom in orange again, is the Lovington zone. We propose to set packer and tubing to inject into the inner space in the Loco Hills only and the other three zones will be exposed below the packer for water injection. The same is for the Mershon. The only difference in the Mershon Well No. 2,that the total depth is down to the top of the San Andres,only exposed in the Loco Hills, Me-Tex and Premier and they are exposed and open hole with the production string set right at the top of the Loco Hills.

Q They're not completed, it's not completed in the Lovington?

A No, it isn't.

Q Please refer to what has been marked Exhibit 6, being the diagramatic sketches of the proposed injection wells. Explain what is shown by those exhibits, or that exhibit.

A This is a diagramatic sketch of the wells to be

converted and also the proposed completion on those wells to be drilled. The first one is Collier-State No. 1 proposed for conversion. It currently has 8 - 5/8ths --

Q Mr. May, without going into each completion, let me ask you, I think the sketch is pretty self-explanatory, is it not?

A Yes.

Q The tops of the cement are not shown on those sketches, have you calculated the top of the cement on the production string?

A Yes, I have.

Q Would you give us the figure for the Collier No. 1?

A On Collier No. 1, it has 5 -1/2 inch casing set at 2298 and one hundred sacks at that well would bring the well back up to 1788 feet.

Q Would you give us the figure for the next well on the exhibit?

A The Vandeventer No. 2 has 4 - 1/2 inch casing set at 2246 feet cemented with 100 sacks and calculated to come back to 1996 feet. The Rotary No. 8 proposed new intake, has 4 - 1/2 inch casing set at 2446,cemented with 100 sacks, brings the top of the cement at 1996 feet. The Rotary No. 7 has 4 - 1/2 inch casing set at 2460, cemented with 100 sacks,

top of the cement would be at 2010 feet. Mershon No. 2, proposed conversion has casing 4 - 1/2 set at 2048 feet cemented with 100 sacks would bring the top of the cement at 1598 feet.

Q Mr. May, all of those wells you propose to inject part down the tubing with a packer and part down the annulus with the exception of the Mershon State No. 2?

A That is correct.

Q The Mershon State No. 2 not being open to the Lovington Sand?

A That's right.

Q Will you explain how you -- beyond what my leading question was -- how you are going to selectively inject into those four different zones?

A The tubing will be plastic-lined set on a packer about midway between the base of the Loco Hills zone and the top of the Me-Tex zone. Through the annular space, we will inject water into the Loco Hills zone which we will control at about 200 barrels of water a day. The other three zones, the Me-Tex, Premier and Lovington will be exposed below the packer, water will be injected through the tubing and each of these zones will receive the water simultaneously. We hope they'll all take about the same rate, but we wouldn't know that unless we took some injectivity test.

MR. NUTTER: What would the total amount injected into those zones be?

THE WITNESS: About 200 into the Loco Hills and about 600 barrels of water a day in the other three zones.

MR. NUTTER: 600 down the tubing and 200 down the annulus?

THE WITNESS: Right.

Q (By Mr. Losee) Do you propose after January 1st, to re-inject your produced water and if so, in what manner will you handle it?

A Yes, we will re-inject the produced water. We will set up at our plant an extra tank so it will receive the produced water and run a dual header into our plant or to the pressure pumps and, for instance, we're injecting fresh water then we get a tank full of salt water, we'll just have the fresh water going in, shut it off while it's receiving and have the salt water turned on, we'll alternately inject and not mix the water.

Q Is your system closed?

A It is closed, yes, with gas seals.

Q What is your source of fresh water, Mr. May?

A Currently the two north wells we're getting water from the Sima Capitan and at the Mershon No. 3, Fina is

injecting water there. In a short time, we are currently building a water line from the Caprock serving several other fluids through the field, coming from the Caprock through the Nichols Artesia and as soon as we have that line installed, we will build our own pressure plant and inject the water with our own plant in this pool, altogether.

Q At what pressure do you propose to inject the water?

A We expect to get up to 2700 pounds at that high, particularly in the lower three zones; we hope we don't have to go that high in the Loco Hills from the experience Fina has had down there.

Q Why do you expect to go that high in the other three zones?

A The sand is less tight, quite a bit less permeable. We have core data that was turned over to us from the Fina wells.

Q If requested by the Commission and prior to injection, would you be willing to test your casing to 3,000 pounds?

A Yes, we would, certainly would.

Q How would you know if a leak developed in the casing under this type of injection system?

A We keep a daily record of the intake rate and pressures at the wellhead at every intake. If we develop a casing leak we would notice for one, say the well was taking 200 barrels of water a day through the casing, all of a sudden it would begin to increase at the same pressure. We would know we would have a casing leak and vice versa, if we started to control that rate of 200 we would find our pressure dropping off, so it will check out either way. We would immediately get on that and take care of that leak, that's the way we operate.

Q What would you do to remedy the leak?

A We would set a retainer in order to protect cement going into the exposed zones and set a packer and tubing above the leak point and squeeze it off.

Q Let me hand you what has been marked Exhibit 7, being Xerox copies of the letters from the working interest and overriding royalty interest and production payment interest owners within this expanded area, in which they all consent to a buffer zone treatment and/or transfer of allowables with the exception of Humble, which consents to the buffer zone treatment and is silent on the transfer of allowables. Is that in general, a summary of the letters?

A That is correct.

Q Now, are the originals in the file of Ryder Scott?

A They are. They are in our Wichita Falls file.

Q Mr. May, do you have an opinion as to whether the expansion of this existing flood with either buffer zone treatment or transfer of allowables and also the approval of these three unorthodox injection well locations will prevent waste and be in the interest of conservation?

A It sure will.

Q Were Exhibits 1 through 6 prepared by you or under your direction?

A That is correct.

Q And Exhibits 7 are actually letters, the originals of which are in your files?

A That is right.

MR. LOSEE: At this time, Mr. Examiner, I would offer Exhibits 1 through 7.

MR. UTZ: Without objection Exhibits 1 through 7 will be entered into the record of this case.

(Whereupon Applicant's Exhibits 1 through 7 were admitted in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. May, your Exhibit No. 1 shows your project area, I interpret this to say that the area outlined in red

is the project area?

A That is correct.

MR. LOSEE: Let me offer one bit of explanation. That would be the entire area. The existing project is encompassed within that red outline too, being the west half of the northwest of 21 and the southeast northeast of 20. That's already under order of the Commission with buffer zone treatment.

MR. UTZ: I see.

Q (By Mr. Utz) Still, well, the east half of the southeast quarter and -- southeast of the northeast of Section 20 and the northeast northeast of Section 20, and the northeast northeast of Section 29, what is the explanation for that area, is that a neither area?

A Excuse me?

Q Is that in neither area? It's neither in Fina No. 2 or your area?

A A new area.

Q Neither area, that's a no man's land, is it?

A No, that's operated by Fina.

Q Both operated by Fina?

A No, this Kersey down here --

MR. LOSEE: Witness pointing to the northeast

northeast of 29, Kersey.

A Yes, Fina has the well, 322 is a relatively recent well, a new well.

Q Would that be in their project area at this time?

A Yes, as far as I understand, it is.

Q Now, you are asking for three non-standard locations, ten feet out of the corners of the respective quarter quarter sections. What is your reason for requesting those non-standard locations?

A It's so that we can protect the correlative rights of each lease. There's not an exchange of oil that's holding within these properties itself, it's so near the joint line of the leases.

Q It has to do with protection of correlative rights rather than sweep efficiency?

A Also sweep efficiency comes into it in order to set up five-spot pattern approximately 40 acres in size. We feel we wouldn't want to go beyond 40 acres, much more that in order to get the recoverable oils we estimate that we can get here.

Q Is the Mershon No. 3 being injected into at this time?

A Yes, it is.

Q You are doing that?

A Fina is furnishing the water for that. There was an agreement with Fina as an exchange well for their 13, 17 and 11, down their Wellsley.

Q That is the only well in the outlined project area on Exhibit 1 that is being injected into at this time?

A Cima Capitan is also injecting water in the 1W and No. 7 on Adkins-Williams Lease. We are paying for that water being injected into those wells.

Q That's outside your area just over the line?

A It's outside of our first area, but it is affecting the proposed area, the part outlined in red, now.

Q You asked for two allowable alternatives here, one is a buffer zone which would in effect be allowing you capacity allowables, is that correct?

A Yes.

Q The other one is a transfer of allowables as between leases within your proposed project area here. Is that the other alternative?

A Yes.

Q On your diagrammatic sketches, Exhibit No. 6, for your Collier No. 1, if my calculations are correct, the cement is 181 feet above the top perforations in the Loco

Hills zone. Is it your opinion that that is enough cement above the Loco Hills zones to withstand the pressures that you intend to use?

A Yes, sir.

Q Which you stated would be something less than 2700 pounds at the surface, you hoped?

A Yes, sir.

Q From the bottom of the 8 - 5/8ths at 543 to 1787 which is -- incidentally, is that a calculated top of the cement?

A That is the calculated top, yes, sir.

Q What do you have in there that might be of any value, any water, oil, gas?

A To the top of the cement down?

Q Yes, between the bottom of the 8 - 5/8ths to the top of the cement, you have open hole behind it?

A It's barren of any oil or gas.

Q Or any water?

A No water; all the water is shut off at the 8 - 5/8ths.

Q Is this fresh water you are going to inject here or salt water?

A Fresh water.

Q How old -- what size casing is your production

string?

A You'll note it right at the very bottom of the figure, five and a half inch casing to 2298 at Collier No. 1.

Q How old is the five and a half inch string in this well?

A At the time the well was --

Q Is it quite old or comparatively new?

A The well was drilled in 1961.

Q So it's pretty new casing?

A Rather new.

Q For wells still in their area, anyway?

A Yes.

Q You don't anticipate any problem then, even though you're injecting down the annulus?

A No, we don't.

Q As far as the casing string is concerned, you will test the casing if we so desire?

A If you request.

Q How much cement have you got above the Loco Hills top perforation in your Vandeventer No. 2? Are you sure about the top of your cement in that well, was that 1996?

A 1996, yes, that's where I calculated it.

Q The top of the Loco Hills zone is 1987, that's

pretty close, isn't it, nine feet of cement over the top?

A May I check this just a moment?

MR. UTZ: Surely.

A That's what it calculates to be 1996, does make it nine feet.

Q That being true, you would be injecting into open hole behind the casing, would you not?

A I've experienced where only two feet of sand, or cement would hold pressures that high above it.

MR. NUTTER: May May, the top of your cement is only one foot above the bottom of your proposed perforations.

MR. LOSEE: Let me ask a question here. This is one of the proposed unorthodox location wells, is it not, and actually if that's the point at which the cement would bring up, you could actually add another 50 sacks or so to bring it up?

THE WITNESS: We certainly would add more cement. I thought we were working with one of the proposed conversions when we were looking at that.

Q (By Mr. Utz) You haven't drilled these wells yet?

A No, We will add plenty of cement up there.

Q Let me ask how much cement you propose to bring up over the top of Loco Hills?

A It will almost be double that, 150 sacks.

Q One hundred feet of cement or one hundred fifty feet?

Q Yes, we will have another 100 feet of cement in there.

Q In these areas that are in this area, I suppose the open hole you propose to leave behind the casing will be non-productive and tight zones?

A Right.

Q With no fresh water, oil or gas?

A No, there isn't.

Q And the same problem, I believe, exists on your Rotary No. 7?

A That is right, it's the same situation there.

Q So you have a minimum of 100 feet above the Loco Hills there, too?

A Right.

Q On your Mershon No. 2 which I believe is already drilled, is it not?

A That is drilled, yes, sir, for proposed conversion.

Q You don't propose to selectively inject there?

A No, we don't. We'll have all those zones exposed at the same time. The Loco Hills there was shot with nitro-

glycerine and if we would try to squeeze that and go in and reperforate we're afraid we will get it exposed again. We will be exposed to locating into the Me-Tex Loco Hills and Premier at the same time. We can't isolate either one, any one.

MR. UTZ: Are there any other questions.

MR. NUTTER: Yes, sir.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. May, in making these calculations of your cement tops, what did you assume,one hundred percent fillup, or do you have a safety factor in there?

A We assumed one hundred percent fillup, yes, sir.

Q According to the log, Exhibit No. 5, I believe it is, it looks like you have a pretty well washed out section through the Loco Hills. That would take quite a little bit of cement wouldn't it? The caliper log there.

A That's in the, excuse me, which well are you referring to?

Q I don't know. I have Exhibit 5, Mershon No. 2.

A The production string is set just above that. That's open hole.

Q That's the open hole?

A Yes.

Q So you are not washed out too badly above there apparently?

A No, we are not washed out above there. The washout has no bearing here as far as cementing the production string is concerned since it's set just at the top of the Loco Hills.

Q In this particular well, you won't have any selective injection, it will all go down the casing, or will you run tubing?

A We may run tubing. We'll likely start off with casing if we are not satisfied, we will run coated tubing right away and set it in the four and a half and inject through the Loco Hills, into the Loco Hills Me-Tex and Premier, through the tubing and packer.

Q You still wouldn't try to set a formation packer?

A No, sir.

Q And attempt any selective injection?

A It would be awfully hard to work, we feel.

Q I presume, then, if you do get into difficulties as far as flooding the Loco Hills, as well as these other three zones, I believe you stated the Loco Hills is more permeable than the others?

A Yes.

Q In the event you have trouble getting water into

the three zones, I presume you could run a small diameter liner in there and attempt to selevtively perforate, to effect stimulation?

A Yes, sir.

Q I notice on Exhibit No. 1 this map here, that you've included in your proposed project area acreage that extends clear down here into Section 29. I don't see that this is being flooded or that it's affected by the flood in any manner. Why did you include all this acreage in the west half of the southeast of 20 and the northwest, northeast of 29?

A It hasn't been; of course, Fina is injecting over there in Section 28. You see, along the west boundary of the area outlined in green the injector No. 15 and 13 reading from the north to the south, in time, we expect stimulation from that and four proposed intakes to the north labeled Rotary-State No. 7 and 8, it will start driving toward the south and if everything is very good, well, we hope to extend the pattern on the Rotary Lease to cover that area.

Q The project area could be extended as additional injection wells are put on?

A Yes.

Q You are aware that Rule 701 defines a project

area as being the 40 acre tracts upon which the injection wells are located, plus the direct and diagonal offsets to those 40's?

A Yes.

Q Granted the 40 acres where the Well No. 5 is would be in the project area because it's actually going to have two injection wells on it?

A Yes.

Q The directly offsetting acreage to the south would be in the project area if it had a well on it, but it doesn't apparently?

A No.

Q Of course, this acreage down here in Section 29 has intervening acreage between it and the waterflood which isn't developed?

A Right.

Q Sima-Capitan is operating this flood up directly north of you in Section 17. Is that flood also a capacity type waterflood project?

A No, it isn't.

Q Now, if we declare the Collier Lease, for example, to be a buffer zone with a capacity allowable, that's actually separated from the nearest injection well in the

waterflood project, the capacity waterflood project to the east by more than a mile, is it not, Mr. May?

A Of course 1 W, on the Sima Capitan, see, we're paying them to put water into 1W and ET No. 7 on Adkin Williams, that's connected by the heavy green line and, of course, that's the nearest injection to the Collier.

Q But you said it wasn't a capacity type flood up here?

A I don't think they ever got a capacity type.

Q So we have a capacity flood over here?

A Yes.

Q The purpose of the buffer zone is to permit acreage that offset a capacity type flood to have equalized injection and producing rates. Then if we consider the green area to be a capacity type flood, we are talking about the Collier Lease on the west side of Section 20, we're getting into acreage that's more than a mile away from the capacity type flood?

A That is correct. Of course, as far as defining it, a capacity type flood on the Adkins-Williams.

Q That's what I asked you, if it was, I thought you said it wasn't.

A Excuse me.

Q Now, the Commission, in approving this original Order, I believe that was for Waterflood Associates, wasn't it?

A That is correct.

Q Designated the west half of the northwest of 21 --

A Right.

Q -- and the southeast northeast of 20?

A That is correct.

Q As capacity acreage?

A Yes, sir.

Q Which comprises 40 acre tracts direct or diagonally offsetting the Fina Flood?

A Yes.

Q Mr. May, in the event this acreage were unitized or otherwise consolidated by some sort of an agreement among the royalty and overriding royalty owners, it would be permissible to transfer allowables from one tract to another. I presume that that's the problem here. You have not consolidated this acreage?

A It has not been.

Q Working interest is all common as soon as you buy this?

A Right.

Q But then you have got overriding and royalty interests that are not consolidated?

A That's right.

Q Is it possible to consolidate those?

A If there could be, the time factor is the big thing, I think, to unitize the area, We were very sorry it wasn't unitized originally by Waterflood Associates and to get it unitized now would be a terrific amount of time.

Q It might not take a full unitization, some sort of an operating agreement or understanding executed by these working interest owners.

MR. NUTTER: Mr. Losee, do you have any thoughts on that subject?

MR. LOSEE: The letters which they have actually filed with the Commission, or copies thereof actually is the consent in effect among the parties to a transfer of allowables. All of these lands entirely within this project are State lands with one common beneficiary, the University of New Mexico. Their problem is actually solved by transfer of allowable. The difficulty arises with respect to across the top tier, there are three separate 40 acre leases and there's not enough relief in the existing Rules, if you consider that some wells and actually as I understand it,

their response in 2 A has already been in the 55 barrel area. It happens to have no injection wells on it, so it's going to get chopped into a 42 barrel allowable. If the Commission would, in their power, permit the transfer of allowables, none of these wells then are going to go, under normal conditions are going to get over a hundred barrels a day; but if you start looking at 42 for those lone 40's, they're not in a situation, they're going to get washed by, I suppose.

MR. NUTTER: I just jotted down, these are the figures you made reference to before the hearing. The Humble is a 40-acre with no injection well, 2-A so it would get a 42 barrel allowable. The same would apply to Humble A lease. Every other lease has an injection well, as well as a producing well on it.

MR. LOSEE: Actually the three, the 2-A which is a Humble, and, of course, this other Humble is still in the buffer zone provisions, this then, but looking across here, this Humble A is a lone 40 --

MR. NUTTER: right.

MR. LOSEE: The Vandeventer is a lone 40 with an injection well.

MR. NUTTER: It has an injection well, so it earns 84 barrels a day, no 42 plus 14 --

MR. LOSEE: 56.

MR. NUTTER: 56 barrels.

MR. LOSEE: And it's already, this well, at least, has already been crowding 55 barrels.

MR. NUTTER: Our highest month of production was 1542 barrels in July of '67, which would be in excess of 50.

MR. LOSEE: This Collier, I don't know whether it's clearly noted on here, but this northeast of the northwest is the Amerada State Collier. Do you have it distinguished? It's a separate lease from the south half.

MR. NUTTER: Oh, I see, the other 80 is the Western-Yates.

MR. LOSEE: Yes.

MR. NUTTER: This is the Amerada State?

MR. LOSEE: Yes, it's really those lone three 40's up there that created the problem. The rest of them, either the transfer of allowables within the lease or the actual allowable under it is going to take care of the situation.

MR. NUTTER: Mr. Losee, may I ask you this question? In the event you have small 40-acre tracts which are not unitized and you have a problem as to production, and your treatment is buffer zones to take care of this production problem aren't you defeating the purpose of the intent of the buffer zone rule?

MR. LOSEE: Well, of course, in part, yes. I wish I had declined to answer your question.

MR. NUTTER: You are not under oath.

MR. LOSEE: I realize that. But the offsetting 40's to the buffer zone are, with actually the Humble A, for instance, is without a great amount of control. It's pushed directly from the north by Sima-Capitan.

Q (By Mr. Nutter) What are the rates of injection in these wells up here to the north, Mr. May?

A Pretty close to 400 barrels of water a day.

Q On both wells?

A Yes, both of them are pretty close to that. It's 300 to 400, in there. I don't have my injection data with me.

Q Do they have all four of these zones open?

A It has the Loco Hills open, I'm sure, and they're giving us some trouble in that zone. There's the Me-Tex and Premier, I'm not sure about the Lovington.

Q It does have the Loco Hills and at least two of the lower three zones in each well?

A Yes.

Q So actually the injection rates up here are not as high as what you contemplated down here, are they?

A Not quite, no, sir. After we get our plan in and get those wells under control, if we can by some, injecting some selective compound, we hopt to get those in balance and with our wells, as far as injection rates are concerned, we think we can, when we get the control of the water injection.

Q What about the Fina Flood? It has peaked out, has it not?

A Yes, it has gone over its peak.

Q Have they cut down on the injection rates in there, or are they still injecting?

A They're still maintaining pretty close top. Some of the wells, that's rather close spacing, some of the wells they have retarded the injection on because of their close spacing and just go in every other well.

Q Do you know what their average water cut is in their flood now?

A Not for sure. I think pretty close to, it's gone over the 50-50 mark, that's all I can say.

Q So it's definitely gone over the hump?

A Yes.

MR. NUTTER: Well, now, Mr. Losee, you said in fact these letters were in effect consents to transfer of allowable.

MR. LOSEE: Yes, with the exception of Humble's letter which doesn't actually answer the question pro or con.

MR. NUTTER: Waterflood Associates, what is their interest in this, are they --

MR. LOSEE: They are actually the owner of the lease and Ryder Scott is operating it.

MR. NUTTER: Is the Management Company operating it?

MR. LOSEE: Yes.

MR. NUTTER: So they agreed to it, the owner agrees to it?

MR. LOSEE: Yes.

MR. MOFFETT: N. W. Staples, on the next letter he signed for Waterflood Associates and he also signed for himself as the original --

MR. LOSEE: I am going to let Mr. Moffett answer this, he's the President of Waterflood Associates and also has an individual interest.

MR. NUTTER: We have a telegram here from Sigfreid, Incorporated. What is their interest?

MR. MOFFETT: Production payment.

MR. NUTTER: Production payment overriding?

MR. MOFFETT: Yes.

MR. NUTTER: In what acreage, all of the acreage?

MR. MOFFETT: All of the acreage.

MR. NUTTER: How about Christianson, the same thing, Mr. Moffett?

MR. MOFFETT: Yes.

MR. NUTTER: Wilkerson?

MR. MOFFETT: That's a production payment on a selective part of the acreage and that part I can't tell you. It's not over the total acreage.

MR. NUTTER: You know, Mr. Losee, the letter states that "we have set up a hearing with the New Mexico Oil Conservation Commission for July 26th, 1967, to ask for a buffer zone allocation or, in other words, unlimited allowables and the ability to transfer allowables." Well, if you have unlimited allowables, there's no necessity for transferring allowables.

MR. LOSEE: Very true.

MR. NUTTER: So in effect, I think if these parties had consented to transfer of allowables it would have read, "to ask for buffer zone allocation or, in other words, unlimited allowables or the ability to transfer allowables"; if they had consented to transfer of allowables, it would have been "or the ability to transfer allowables."

MR. LOSEE: Well, Mr. Nutter, I didn't draft the letter, and I might have used that language,too. I think

the reading of the, "and the transfer of allowables," It's not. I would have preferred to use, "or".

MR. NUTTER: Could we get consent from these companies to the transfer of allowables?

MR. MOFFETT: I think we could.

MR. NUTTER: And these owners?

MR. MOFFETT: It would take a matter of time. If you recall, Mr. Nutter, I talked to you on the telephone about this thing. This was your suggestion, this letter.

MR. NUTTER: That we get some agreement to transfer of allowables.

MR. MOFFETT: Yes, or buffer zone, either one, because you and I had talked on the telephone about this thing.

MR. NUTTER: I didn't know you were talking a mile away when you were talking buffer zone. You had a problem with one 40 here.

MR. MOFFETT: Right, and at that time, we didn't think, I believe it was you that came back and told me that we did not have trouble with the other 40 and then we got to looking at the thing and the Artesia Office called me and said it was not included, so we took the thing as a whole and went over it. We tried to cover every aspect in the letter.

I think, yes, that we could get these people all to agree. I don't think we would have any trouble at all. The time factor would be a problem, some of them are in Hiwaii, one of them is in Viet Nam; no telling where Mr. Sigfreid is, he might be hunting bears in Alaska.

MR. NUTTER: What about Mr. Mayfield,who sent the telegram for him?

MR. MOFFETT: It's possible that he could. We finally got him to contact Mr. Sigfreid and get his approval and then send the telegram so that we would have 100% of all the interest owners with the exception of the State, approve that letter, but the time factor here is it. Yes, I am sure we could, the people would agree to it.

MR. NUTTER: I direct this question to Mr. May.

Q (By Mr. Nutter) Mr. May in the event we had complete flexibility of transferring allowables around here in this project area and if the project area were defined as set forth in Rule 701, we would have a minimum allowable that could be produced from the wells in the area of 476 barrels per day. Do you think that that's sufficient allowable to operate the project?

A For this entire project here, considering all the producers?

Q With the existing producing wells and the proposed injection wells and --

A Yes, sir.

Q -- and we would draw the line project area right across here. This 40 has injection wells on it,if there were a well down here, it could earn credit too.

MR. MOFFETT: You would take this in when we developed it.

Q (By Mr. Nutter) Oh, yes, the project area would be expanded as the additional wells were put on production.

A 476 barrels per day?

Q 476 barrels per day.

A It could pretty well be taken care of.

Q Well, actually --

A Six producers getting pretty close to 80 barrels per day per well. I think it would be all right.

Q Maybe I had better correct that, because we have a buffer zone. You would lose some credit for that but the buffer zone would be operated at capacity. We have three-fourths and one extra well that is 140 barrels off the 476, so actually what it would be, would be 336 barrels for this acreage.

A 336.

Q You'd have two capacity wells, being the Humble No. 1 and the Mershon No. 1?

A Yes, let me ask this question. Our Rotary No. 7 and No. 8, is your figuring including credit for those two injectors on the Rotary Lease?

Q Yes, it is.

A O. K. Yes, that 336 barrels would come very close to taking care of us.

MR. NUTTER: Mr. Losee in the event that the Commissio should enter an Order on a temporary basis to permit the wells to be operated in the buffer zone for temporary period of time, an effort could be made to get the consent of these parties to the transfer of allowables, could it not?

MR. LOSEE: Yes. I feel like that if the order were entered that way it would allow us oh, I suppose 60 or 90 days to get them.

MR. NUTTER: Mr. Moffett, would 90 days be sufficient?

MR. MOFFETT: Ninety days would be fine.

Q (By Mr. Nutter) And you do eventually, if this is successful here, and the flood around your No. 5 Rotary you plan to put some wells south of the 5?

A Yes, sir, jointly with T P Oil Company on the

west and Fina to the east.

MR. NUTTER: I think that's all I have, Mr. May. Mr. Losee and Mr. Moffett, thank you.

RECROSS EXAMINATION

BY MR. UTZ:

Q Is the Fina No. 323, which is in the northeast of the southeast, producing?

A Yes, sir.

Q Has that received response?

A I don't have the monthly figures to determine that. I understand it's making about 40 barrels a day. I believe it's made that, it's a recent well, I believe it started off about that and it's maintained that.

Q Couldn't that be considered a part of the buffer zone, if that 322, a part of the Fina Flood No. 2 project area?

MR. NUTTER: I don't know how that would be considered, Mr. Utz, I don't know if that's a legitimate expansion of an existing flood or not.

MR. UTZ: If it was,then the buffer zone could be expanded by two 40's, am I correct?

MR. NUTTER: Rule 701 provides that capacity allowables would be granted to waterfloods approved prior to

1959 and to legitimate expansions of the floods. This might be an illegitimate expansion, I don't know. There is no injection out here on this lease, evidently.

MR. LOSEE: Actually, I don't think the rule defines the end of the buffer zone.

MR. NUTTER: It doesn't?

MR. LOSEE: I recognize what the intent was, but it just authorizes the Commission to grant buffer zones.

MR. NUTTER: I think most buffer zones have been held two locations deep at the most, Mr. Losee.

MR. LOSEE: Well, our recognized practice has --

MR. UTZ: Are there any other questions of sworn or unsworn witnesses?

MR. LOSEE: I have one, two letters with respect to the unorthodox, addressed to Ryder Scott. I think you probably have a telegram.

MR. NUTTER: Did you receive these in the normal course of business?

THE WITNESS: Yes.

MR. LOSEE: Why don't I offer these as Exhibit 8?

(Whereupon, Applicant's Exhibit 8 was marked for identification.)

MR. LOSEE: And I ask to withdraw them, if I may, after they have served their purpose, being the consent of

American Petroleum, Fina and Texas Pacific to the unorthodox location.

MR. UTZ: Do you want copies of them?

MR. LOSEE: We would like the original because it's an agreement to share the cost. I will make copies if I may, and leave them with the Commission.

MR. UTZ: We'll be happy to make copies and give you the originals. Are there any other questions?

MR. HATCH: We don't have the telegram.

MR. UTZ: The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements? The case will be taken under advisement.

I N D E X

EXHIBITS	MARKED	OFFERED AND ADMITTED
Applicant's 1 through 7	4	23
Applicant's 8	49	

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

WITNESS my hand this 28th day of November, 1967.

Ada Dearnley
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3678, heard by me on 10-25-67.

New Mexico Oil Conservation Commission