

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

EXAMINER HEARING

IN THE MATTER OF:

Application of Ambassador Oil Corporation for
a unit agreement, Lea County, New Mexico.

Application of Ambassador Oil Corporation for
a waterflood project, Lea County, New Mexico.

Case No. 2954

Case No. 2955

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

December 4, 1963.

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MR. UTZ: 2954.

MR. DURRETT: Application of Ambassador Oil Corporation for a unit agreement, Lea County, New Mexico.

MR. JENNINGS: Mr. Examiner, I'm Jim Jennings, appearing for Ambassador Oil Corporation. This was filed as one application, shall we combine them, or how would you prefer that we handle it?

MR. UTZ: I think it would be in order to consolidate for the purposes of testimony. Will you have the same witness on both cases?

MR. JENNINGS: We have one witness.

MR. DURRETT: We'll write separate orders.

(Witness sworn.)

MR. JENNINGS: Mr. Examiner, we have several exhibits here, if you would mark this first one as Exhibit A, and we're fouled up because we have several Exhibits A, if you will make this 2954 Exhibit A.

(Whereupon, Applicant's Exhibit 2954-A was marked for identification.)

MR. BRATTON: Howard Bratton on behalf of Humble Oil and Refining Company.

MR. UTZ: Are there other appearances in this case?



MR. JENNINGS: We have four more exhibits. They're 2955-A, which is a map showing wells within a two-mile radius from the proposed injection well, No. 2955-B, which is a stage development plan, 2955-C, which is a map showing the outlines of the unit boundary, and 2955-D, which is an injection well casing program.

(Whereupon, Applicant's Exhibits 2955-A, B, C & D were marked for identification.)

MR. JENNINGS: I have one other preliminary remark. We have heretofore furnished the Commission with a copy of the proposed unit agreement and unit operating agreement, and if you would like to have one of these submitted as an exhibit we can, we have additional copies, but we did attach one with our application.

MR. UTZ: I don't see why we can't mark one of these as an official exhibit.

MR. JENNINGS: I think that is in two sections. One is a unit agreement and one a unit operating agreement.

MR. NUTTER: These will be Case 2954 and do you want them marked as Exhibits B and C?

MR. JENNINGS: That will be fine.

MR. NUTTER: The unit agreement is B and the operating agreement, Exhibit C in 2954.

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(Whereupon, Applicant's Exhibits 2954-B and C were marked for identification.)

E. A. RILEY

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

DIRECT EXAMINATION

BY MR. JENNINGS:

Q Would you state your name and occupation, please?

A E. A. Riley, Assistant Vice President in charge of Secondary Recovery with Ambassador Oil Corporation.

Q Mr. Riley, have you appeared before and testified before this Commission many times?

A Yes, I have.

MR. JENNINGS: Are the witness's qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q Mr. Riley, would you describe the formation to be covered by your proposed unit and the unit area covered?

A Yes. The productive zone proposed in this unitization application is the Langlie-Mattix zone and is defined as the lower 100 feet of the Seven Rivers and all of the Queen formation known locally as the Penrose sand throughout the unit area. The sand occurs in multiple stringers or lenses within a dense

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dolomitic limestone with an overall gross thickness of 369 feet in Sinclair Oil and Gas Company's A. L. Christmas No. 3.

Q What lands generally does this unit cover, and how many acres?

A The proposed unit comprising 3920 acres more or less is contained in all or portions of Sections 14, 20, 21, 22, 23, 26, 27, 28, 29, 32, 33 and 34, Township 22 South, Range 37 East of Lea County, New Mexico.

Total of three tracts containing 280 acres or approximately 7 percent are federal lands, eight tracts containing 680 acres or approximately 18 percent are state land and 32 tracts containing 2920 acres, or approximately 75 percent are patented fee lands.

Q I hand you what has been marked as Exhibit A of 2954 and ask you to identify that.

A Exhibit A is a map showing the unit boundaries indicated by the hashed lines surrounding the unit area and upon this map we have identified the three types of tracts, state, federal, fee by a color code. The state tracts being colored green, the federal tracts red and the fee tracts white.

Q Who is the unit operator?

A Ambassador Oil Corporation is the proposed unit operator.

Q Is the unit agreement in substantially the form that has been approved by the Commissioner of Public Lands of the State

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of New Mexico, the Director of the United States Geological Survey and this Commission?

A Yes, it is.

Q Has this unit been submitted to the Commissioner of Public Lands and the Director of the United States Geological Survey for tentative approval?

A Yes, it has.

Q Have you been notified of any action on behalf of either of these organizations?

A The Commissioner of Public Lands approved the unit as to form and content in this letter addressed to Ambassador, letter dated September 21, 1962, the Department of Interior approved the unit agreement and designated the area as one logical for unitization in their letter to Ambassador dated February 4, 1963.

Q Do you have copies of those letters?

A I have copies of these letters.

MR. JENNINGS: We would like to offer these letters and we have them in duplicate.

(Whereupon, Applicant's Exhibits Nos. D and E were marked for identification.)

MR. NUTTER: The letter from the United States Geological Survey is Exhibit D, the letter from the Commissioner of Public

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Lands is Exhibit E.

Q (By Mr. Jennings) Mr. Riley, what percentage participation do you have of the working interest owners of this unit agreement?

A One hundred percent of the working interest owners in the unit area have approved the unit agreement with the exception of three tracts, Tracts 3, 4 and 38, which will not join the unit until after the unit effective date, and plan to petition the unit for subsequent joinder under a negotiation basis.

MR. UTZ: 3, 4 and 38?

A 3, 4 and 38. Approximately 55 percent of the royalty interest, I should modify that to say 55 percent of the tracts have been qualified by the signature of royalty interest, 20 percent have qualified their tracts verbally. Those tracts having percentages from six to eight percent of the 12½ percent common royalty already signed, and the remainder necessary to qualify the tracts by the terms of the document have verbally agreed to execute their ratification and forward them. 25 percent of the tracts are partially qualified and we anticipate their qualification within the next month.

Q Mr. Riley, in your opinion will the unit lead to a more efficient and orderly development and operation of the existing waterflood being carried on in the area?

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A Yes, it will.

Q Is it necessary to allow you to completely develop your waterflood project?

A Yes, it is.

Q Will the unit promote conservation of oil and gas and prevent waste?

A Yes, it should.

Q What is the proposed effective date of the unit?

A The proposed effective date of the unit will be upon the completion of three stages. Following tract qualification by the terms of the document, we will then submit copies of those ratifications, both working interest and royalty interest, to the State Land Commission for their certification, and also copies to the Department of Interior for their certification.

Following receipt of those certifications, the documents will have to be filed in the county of record and certificate of unitization filed with the County Clerk; at that time the unit will be effective.

In the documents the term within which the unit must be formed is stipulated as January 1, 1964. We are in the process of amending this with the working interest owners to extend this period to June 1, '64.

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Q Within thirty days after the effective date of the unit will you file an executed copy or counterpart thereof of the unit agreement with the Commission?

A Yes, we will.

Q The unit agreement provides for subsequent joinder of other parties?

A Yes, it does.

MR. JENNINGS: If it please the Commission, that's all we have to offer on the unit. We can proceed, or if there's anything at this time that we should refer to on this. I don't know how you prefer to handle it.

MR. UTZ: Let's cross examine the witness, if there is any in regards to the unit, and then proceed to the project. Are there questions? Mr. Nutter.

CROSS EXAMINATION

BY MR. NUTTER:

Q You stated that the unitized zone was the Langlie-Mattix zone, defined as--

A Yes.

Q Then you went and defined it as that defined in the unit agreement?

A Yes.

Q As being the lower hundred feet of the Seven Rivers and

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the Queen?

A That's verbatim from the document.

Q You said you had 100 percent of the working interest except the three tracts?

A That is correct.

Q Have they stated in writing that this was the procedure that they would follow to come into the unit?

A They have notified us in writing, that is correct.

Q They do plan to join but on the subsequent joinder basis.

A Under the negotiation terms it will not be under the participation formula that is now in effect?

Q You also stated that 55 percent of the tracts have been approved insofar as the royalty interest was concerned, is that 55 percent of the acreage or of the tracts?

A Of the tracts by county.

Q Are you counting the state and federal tracts as being committed because you have tentative approval?

A Yes, I am.

Q Acreagewise what percent of the acreage has been committed?

A I don't have that, Mr. Nutter. I might, with a little bit of surveying here, be able to give you the number. Since

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they qualify by tracts and not by acreage, I did not summarize that in that fashion. I could report later to you on that.

Q Would it be easier to run down the tracts that have or haven't?

A Yes, I certainly can. Those that I qualified as 55 percent qualified will be Tract 5-A, 5-B, 7, 9, 11, 13-B, 13-C, 13-D, 14, 15, 16, 19, 20, 21, 29, 30, 31, 34, 35, 36 and 37.

Q Those are the ones that have committed?

A That is correct.

MR. NUTTER: Thank you, that's all.

MR. UTZ: Any other questions? You may proceed to the waterflood project.

A We also have for submission, or offer to submit to the Commission the proposed plan of waterflood operations. It's a brief outline and engineering report that was submitted to the United States Geological Survey that might be of aid to them in studying this unit. It gives the engineering, geological data and such as that in a summary fashion.

MR. UTZ: I'm sure we would like to have it.

Q (By Mr. Jennings) Was this prepared by you, Mr. Riley?

A Yes, this was prepared by me.

MR. JENNINGS: We would like to offer Exhibit 2954-F, which is a proposed, it is designated proposed waterflood Langlie-

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Mattix Penrose Sand Unit, Lea County, New Mexico.

MR. UTZ: Exhibit F to Case 2954 will be accepted in the record.

(Whereupon, Applicant's Exhibit 2954-F was marked, offered and admitted in evidence.)

REDIRECT EXAMINATION

BY MR. JENNINGS:

Q Mr. Riley, is part of the land embraced in the unit now in a waterflood project?

A Yes, it is.

Q I hand you here what has been marked as Exhibit 2955-A and ask you to identify that.

A Exhibit 2955-A is a map showing wells in a two-mile radius from the proposed injection wells with the current injections wells encircled in green and the proposed injection wells encircled in red. Also shown with red outline is the proposed unit boundary.

MR. UTZ: Two-mile radius with the exception to the south?

A To the south, that is correct.

Q Would you identify the injection wells in which the water is presently being injected by you?

A Would you want me to identify those by their current

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lease names and numbers?

Q I think it would be better to identify them by well number and location.

MR. UTZ: Is that set out in your application?

MR. JENNINGS: Yes, sir. I would like to call the attention of the Examiner to one misstatement in the application, Well No. 21-7 is stated that the applicant is injecting water in that, and I believe that is not correct. That is being injected by Humble.

A The current injection wells consist of what is identified in the application as Well 36-1, which is in the Northwest of the Northeast of Section 34, and 37-1, which is in the Northwest of the Southeast of Section 34. Those wells are currently owned and operated by Ambassador Oil Corporation. The other well Mr. Jennings mentioned is what has been identified as Well 21-7 in the Southeast of the Northwest of Section 34, which is Humble's State "H" No. 7 well.

Q Is there any water being injected in any other wells in the immediate vicinity?

A Outside the unit limits, Skelly Oil Company is injecting water into their H. O. Simms Well No. 8 in the Southeast of the Southwest of Section 34, and H. O. Simms No. 9 in the Northwest of the Southwest of Section 34.



Q Could you give the number of the wells and the description thereof where you plan to inject water?

A We propose to expand the present pilot operation to include injecting water into wells identified as 19-1, which is in the Northwest of the Southeast of Section 27; 19-2 in the Southeast of the Southeast, Section 27; 21-2, which is in the Southeast of the Southwest of Section 27; 21-3, which is in the Northwest of the Northwest of Section 34, and 35-2, which is in the Southeast of the Northeast, Section 33.

Q Mr. Riley, I hand you what has been marked as Exhibits 2955-B, C and D, and ask you to identify those, if you will. Tell what they are.

A Exhibit 2955-B is a map showing the stage development that is being proposed in this application, with Stage 1 being the wells just mentioned. The normal development would be on a conventional five-spot emanating in a northwesterly direction from the current injection pattern. These stages would be placed on injection when they met the Commission requirements as stipulated in Rule 701. The stages run from Stage 1 through Stage 6.

Exhibit 2955-C is a unit boundary map which is a small version of the larger map that we have previously presented. It shows the unit boundaries enclosed in the hashed line.

Exhibit 2955-D is a schematic showing the injection well



casing program with the surface casing intermediate string, second intermediate string in some wells, a third intermediate string in other wells, and a production string in all wells showing the amount of pipe, the size of pipe set, the amount of cement used in setting that particular string of pipe, and in two cases two liners in Wells 21-2 and 21-3 that were set attached to the main production string.

Q Mr. Riley, could you state briefly your plan of operation in connection with this unit, the waterflood?

A Well, following effective unit formation, we propose to convert the aforementioned five injection wells to water injection status and conduct the pilot in conjunction with the current pilot program until the response is indicated, and sufficient response is indicated in enough wells to meet the Commission's Rule 701, and the pilot will then be expanded in an orderly fashion therefrom with each succeeding row of wells qualifying for conversion.

Q What is the state of the production from the wells located within the unit?

A Most of the wells in the area of the current pilot are in the low stage of oil production at this time and are essentially in the late flood life stage.

Q Definitely stripper wells?



A Definitely.

Q Has the pilot flood indicated the feasibility of water-flooding the Penrose sand?

A Yes, it has, to date there has been an approximate cumulative secondary recovery due to water injection of 160,000 barrels recovered from the acreage owned by Humble, Ambassador and Skelly.

Q Has the pilot flood indicated that flooding will result in an ultimate recovery of oil and prevent waste?

A Yes, it has.

Q What type of water do you plan to use?

A We're currently using water from the Santa Rosa formation which occurs at approximately 700 to 750 feet, and that is our first prime target for future water supply. If we're unable to get an adequate supply from that, we plan to try to secure water from the San Andres within the unit area or a reef water to the west of the unit area some five to six miles. However, we do feel that the Santa Rosa will be sufficiently productive to supply the water. This water is a slightly brackish water that has so far been very satisfactory for injection purposes.

Q Have you furnished the State Engineer of the State of New Mexico with data concerning the wells and the manner in which the water is to be injected?

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A Yes, we have.

Q How is the water to be injected?

A It will be injected through tubing under packer in each injection well by use of a triplex.

Q Generally what is the casing program on these wells, or do you know?

A Well, the casing program has been shown on a previous exhibit, 2955-D.

Q When were the wells drilled?

A These wells were drilled, the discovery well was drilled in 1936 and subsequent development history is carried in the exhibit previously submitted, which is 2954.

MR. JENNINGS: Mr. Examiner, has the State Engineer indicated that he has no objection to this?

MR. UTZ: The State Engineer has offered a letter, which I understand is favorable. Do you care to see the letter?

MR. JENNINGS: No.

MR. UTZ: "Enclosed copy of a letter from Ambassador Oil Corporation dated November 26, 1963 states that water injection will be through tubing and under packer in the five proposed injection wells. Therefore, this office offers no objection to the granting of this application."

MR. JENNINGS: I would like to have that marked and offered.

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(Whereupon, Applicant's Exhibit 2955-E was marked for identification.)

MR. NUTTER: Was it your intent that this report would be in the unit case or the waterflood case?

A I think it should properly be in the unit case, Mr. Nutter.

MR. NUTTER: In the unit case. We identified that as F in 1954?

MR. JENNINGS: That's correct.

MR. NUTTER: I believe this will be F in the waterflood case.

MR. UTZ: The last one I have is D.

MR. NUTTER: This will be E, the letter from the State Engineer, 2955?

MR. JENNINGS: Yes.

Q (By Mr. Jennings) Mr. Riley, is this area adjacent to any areas which are now being flooded?

A Yes. Humble Oil and Refining has recently applied for, I'm not positive that it has been approved or is in operation, but should be shortly, for a unit adjoining it to the west. Also Skelly Oil Company has announced plans to cooperatively waterflood along the southern unit boundary line on the H. O. Simms lease. There are also other waterfloods operating further to the



south and I think one of them is the Woolworth Unit, and possibly there are others.

MR. UTZ: Those later ones are considerably to the south, aren't they?

A Considerably to the south, that is correct.

Q Is the waterflood operation being carried on at this time in the South Half of Section 33 and Southwest Quarter of Section 34, Township 24 South, Range 37 East?

A Would you repeat the first part of that?

Q The South Half of Section 33.

A Response has been felt in the South Half of Section 33 from injection wells located to the east and South Half of Section 34. Presently waterflood operations are being conducted in all of Section 34.

Q Is there a waterflood operation also being conducted in the section immediately south there in Sections 3 and 4?

A No, they are not to my knowledge.

Q Has there ever been one, or do you know?

A None to my knowledge. I might point out at this point that the original application on the Ambassador acreage, as far as the waterflood, was entered under a different company. We have acquired the properties subsequent to that time. The original waterflood application was under the name of Gulf Coast Western.

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Q When was that?

A That was in 1956, I think.

Q Was that in Case No. 993?

A I think that's right.

Q Order R-772?

A No, I think there's an earlier application to that. I think it's Order R-179-A.

MR. UTZ: I believe that's correct. However, there were three applicants, Skelly, Gulf Coast and Humble.

A That's correct. According to my records that is correct.

Q Then this waterflood is in the extension of an existing flood heretofore authorized by the Commission?

A Yes, it is. Also I might should point out, Mr. Jennings, at this point, that the Order R-772 was an application by Humble Oil and Refining and Gulf Coast Western to expand the current pilot program to a portion of the area that we're now applying for. That expansion was never completed and the wells are described in Order R-772.

MR. UTZ: Those four wells in that particular order were never converted to injection wells?

A That is correct.

Q (By Mr. Jennings) These are some of the wells that you



now propose to convert?

A Three of the wells are, the exceptions, Gulf Coast F. Glier No. 3, it is not in the present application.

MR. UTZ: That's the well in the Northwest, Northeast of 33?

A Northwest of the Northeast of Section 33, correct.

Q Do you know, Mr. Riley, if this flood was established prior to the effective date of Rule 701-E?

A Yes, it was.

MR. JENNINGS: Could you supply that date?

MR. BRATTON: November 9, 1959.

MR. DURRETT: Mr. Bratton says it's November 9, 1959.

Q (By Mr. Jennings) Do you know what allowable was established for the wells immediately south of the present flood, or immediately south and adjoining this unit?

A In Order R-179-B, Skelly Oil Company received permission to produce from their H. O. Simms lease, I quote, "The allowable assigned to the above-described H. O. Simms lease in the Penrose-Skelly Pool, now known as the Langlie-Mattix Pool, may be produced from any well or wells on said lease, and any proportion, provided that no individual well shall be produced in excess of six times top unit allowable for the pool." That is the only exception that has been granted to this.



MR. UTZ: That area, however, is outside your unit area?

A It is immediately adjacent and part of the present pilot operation.

Q Is the present pilot operation within the boundaries of the unit?

A A portion of it. Yes, four of the six injection wells are within the unit area.

Q Do you feel that you can conduct your flood operations efficiently in accordance with the provisions of this existing order which you just mentioned which was the Skelly order?

A I think we can.

Q You have asked that you be granted a capacity allowable?

A Yes.

Q Is there a capacity allowable in any of the adjacent floods to your knowledge?

A No, there are not.

Q This is the only --

A This is the only exception to the allowable that I know of.

Q Do you have anything further that you wish to add, Mr. Riley?

A No, I believe that concludes my testimony.



Q Were the exhibits offered other than the unit agreements all prepared by you or under your direction?

A Yes, sir, they were.

MR. JENNINGS: We would like to offer Exhibits 2954-A through F and 2955-A through E at this time.

MR. UTZ: Without objection the Exhibits 2954 A through F and 2955-A through E will be introduced in the record of these cases.

MR. JENNINGS: We have nothing further.

MR. UTZ: Are there questions of the witness? Mr. Nutter.

RE CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Riley, you gave us a casing program on the five wells which you are proposing to convert to injection under this application. Is that casing program typical of most of the wells in this unit area?

A To the best of my knowledge, yes.

Q You stated that injection in all of these five wells would be through tubing under a packer?

A That's correct.

Q Would that be your intent for the remainder of the injection wells in the unit?



A There is a possibility, Mr. Nutter, that we will have to set liners through the pay zone and inject through perforations under packer through the tubing. This will have to be ascertained by actual operations.

Q Some of these wells actually do have liners?

A Some of them do.

Q And some of them are evidently going to be completed open hole for injection?

A Yes.

Q They have been producing open hole and they will be left that way?

A Yes.

Q Is it your intent to do anything with the annulus between the tubing and the casing there, fill it with any kind --

A We customarily load the annulus under such an operation with an inhibited fluid.

Q You wouldn't have any objection to the order of the Commission requiring a non-corrosive fluid in the annulus over the packer?

A I don't think we would, no.

Q You said that your secondary recovery in this area has yielded approximately 160,000 barrels, I believe?

A That is correct.



Q When was water injection first commenced here?

A In 1956, to the best of my knowledge. I point out that we were not the operator at that time and it is my understanding that only five of the six wells were only actually initiated at that time with the sixth one being initiated some eight to nine months thereafter.

Q Looking up these orders a while back I came across orders that authorized some of these wells for water injection. I failed to find an order for one of them here.

A I think we found the same thing.

Q Would that be for the T. O. May No. 4 well?

A Yes.

Q You don't know under what authority it was ever put on injection?

A No, it was currently under injection when we acquired the properties.

Q Would you like an order to come out of this order to include that well?

A If there is none such we certainly would.

Q We couldn't find any just like you couldn't. Disregarding the Skelly flood to the south of Section 34, but including it in consideration here of this six-well pilot that we've got, we have two injection wells on Skelly Simms lease, the No. 8 and 9.



We have three Ambassador injection wells, the May 1 and 4 and the Humble State 1, we have one Humble well, the No. 7. Could you give me the production history of the two wells that are included in those two five-spot patterns there, being the T. O. May No. 3, the H. O. Simms No. 6?

A The H. O. Simms 6 has been by far the outstanding well and has recovered in excess of 90,000 barrels of waterflood oil. The T. O. May 3, I'm referring to my memory now, has not responded I know nearly as well, but it has recovered somewhere in the range of 20,000 barrels of secondary oil. The best well on that side has been the T. O. May 5 which has recovered 40,000 barrels. It is still the best well in the area and producing somewhere in the area of 16 barrels a day.

Q At the present time?

A Yes.

Q Do you know what the peak rate of production for any of these wells was after the water injection was started?

A I don't recall that. I think it was inadvertently omitted from the exhibit, we indicated it was in that proposed plan of waterflood operation. We do have the curves. To the best of my knowledge somewhere in the range of 90 to 100 barrels a day on the H. O. Simms six.

Q Not only has it recovered more cumulative secondary



recovery oil, but it also had the highest daily rate of production?

A That is correct. I did point out, however, that the injection was quite intermittent through a great portion of the flood due to corrosive problems with water. Humble is using a very corrosive water, and so is Skelly. They are not using the Santa Rosa water. They had considerable trouble along with Gulf Coast Western keeping it continuous, so possibly the 100 to 90 barrels a day peak rate is not a good criterion for a properly-conducted waterflood because we have been injecting in the injection wells since we acquired at the rate of three to four hundred barrels a day.

Q What is your anticipated rate of injection into the five wells that you are requesting?

A Probably 400 barrels a day.

Q Four Hundred. Would that be until you get fill-up or would that be your rate of injection throughout the rate of the flood?

A No, our operational flood consists of injecting in rates just below breakdown pressure and so we can maintain maximum vertical sweep first. So we might exceed 400 barrels.

Q In other words, your philosophy calls for the three to four hundred during fill-up and afterwards?

A That is correct.



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Q Have you computed what the allowable for this area would be for this area in your unit if you were operating under a project allowable computed by Rule 701?

A No, I haven't. But I think we could readily see what it would be. I did point out that the plans are to stage develop and they themselves would dictate what allowable you would be operating under, would they not? Under our impression you have a certain number of well counts that you have to count in in an affected area, and because of this we have not calculated this. There will be 91 wells in the unit area, some undrilled locations being drilled during subsequent development, so there will be approximately 100 wells in the unit when the total development is consummated.

Q On total development?

A Right.

Q You haven't actually figured out what the project allowable would be? You would have nine injection wells on your unit with the approval of these additional five?

A Five and four is nine, right.

Q Mr. Riley, do you know if there are any 40-acre tracts in this area that have more than one well on them except the northeast?

A The T. O. May lease.



Q The Northeast of Section 34 there?

A T. O. May is the only one to my knowledge. Some of the wells might be off normal location, but basically the rest of them are one well to 40.

Q You are acquainted with the provisions, the allowable provisions of Rule 701 of the Commission rules and regulations, aren't you, in the determination of project areas?

A I think so, yes.

Q I hand you Exhibit A in Case 2954 where I have outlined the project area, being the direct and diagonal offsets to the nine injection wells. Would I be correct in saying there are approximately 30 - 40-acre tracts in that project area?

A I think you would be. I think you counted them, I did not check your counting but I would accept it.

Q If 30 would be the correct figure, and there would be one tract with two wells on it, would the project allowable be approximately 1274 barrels?

A That's my understanding of the method used in 701, yes.

Q In the experience that Ambassador has had operating the flood that Great Western and Gulf Coast Western previously operated, and taking into consideration the previous performance of all of the wells in this area, can you foresee any operating difficulties resulting from operating a project under an allowable here of



1274 barrels? If so, why?

A I point out that the entire pilot area, with the exception of Humble's well, has been basically up until we acquired the property in the open hole. There's a very severe theiving zone above the pay zone some 50 to 60 feet that a great portion of the water was conducted across through this thief zone and resulted in premature water breakthrough, and in many cases nothing but water production in the offset wells. Consequently, we feel that only a portion of the water went into the formation main pay zone and waterlogged the formation.

We think that since then we have attempted some remedial measures to this, but we haven't been too successful, and because of this I don't think the past history is too indicative of the production response to any given injection rate.

Consequently, I couldn't very well answer your question, I don't think, unless I knew how the reservoir was going to perform under a properly conducted waterflood.

Q I noticed you obtained five million barrels of secondary recovery in here.

A That's correct.

Q This is taking into account a more efficient flooding operation than has been obtained to date?

A Yes.



Q As far as you know, is this area of the Langlie-Mattix substantially different than other portions of the Langlie-Mattix for other flood operations that have been organized and under way?

A I am not familiar with the other areas, but I have heard quoted that the Penrose is a solid body in the area to the south, whereas in this area of the Langlie-Mattix the Penrose is basically three stringers in an overall gross section of 200 feet.

Q There has been a flood authorized to the north of this also. Do you know if that flood is in operation?

A I think that one has been terminated and was conducted in the Grayburg formation. It's some two and a half miles to the north.

Q It's not in operation at the present time?

A It's not in operation.

Q I see. Has there been any response to date from either this area with its four injection wells on the unit or the Skelly lease to the south where the response has been so vigorous as to be difficult to produce under the provisions of Rule 701 with a project allowable?

A The only example I could cite would be the H. O. Simms 6 which would be somewhat in excess considering that every other location is an injection well, so each producing well would then have an allowable of twice 42, or 84, would be in excess of this.

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Q That well made approximately 100 barrels at its maximum rate?

A Yes, as I recollect.

Q Do you know what Skelly's rate of injection was when they were able to inject?

A We have reasoned that the response in that well basically was the result of the proper injection into Humble's State "H" No. 7, which was a well that had the pipe set through. In that well they have averaged some 300 barrels a day to the best of my knowledge.

Q So you attributed most of the success of No. 6 to the casing program in the No. 7?

A Yes, we did.

Q Rather than to the water injected into the 8 and 9?

A I think that's correct.

Q Are 8 and 9 both open hole completions?

A Yes.

MR. NUTTER: I believe that's all. Thank you.

BY MR. UTZ:

Q On the three wells that you are now injecting water in, which is the T. O. May No. 1 and 4 and the Gulf State 1, what type of equipment do you have in those wells?

A Two of those have liners set in them uncemented. The



other one we were experimenting along with Shell in an attempt to reduce cost and we attempted to pack the shot hole with pea gravel. That has proved unsatisfactory, however, since residue and precipitation residue out of the water leaks out on top of the pea gravel and shuts off water injection. So we know that this isn't the answer to proper well completion.

Q Do you have tubing installed in these wells?

A Yes, we do.

Q And packer?

A Yes.

Q What size tubing?

A Two inch EUE.

Q Is that the size tubing you propose to put in your other injection wells?

A Yes, it is.

Q What type of pumping equipment do you have now for the injection of water into these three wells?

A We currently are operating our station. Humble operates their station and Skelly operates theirs. Our station contains an Ajax 2P 200 series triplex pressure pump prime moved by DP-1 as an Ajax motor.

Q How much water is that pump capable of handling?

A Capable of producing at the current injection pressures

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of 1700 pounds, some 3,000 barrels a day.

Q Do you plan to install more equipment, more pumping equipment for these additional injection wells?

A Yes, it will be necessary.

Q At the present time you are injecting what, about three or four hundred barrels a day in the May No. 4?

A Yes, approximately that.

Q And the Humble State somewhat less?

A Yes.

Q Is there any particular reason why you haven't been injecting water in the T. O. May No. 1?

A That is the well that was, we attempted completion by packing the well bore with pea gravel and it has given us considerable trouble, and rather than make an expenditure that would be unrecovered, I proposed to leave it shut in until the unit was formed and then try recompletion work on the well.

Q If you were not granted capacity allowables would your present equipment handle the number of injection wells which you propose to inject into now?

A I didn't quite hear your question.

Q If the capacity allowables were not granted for this flood, based on the number of injection wells which you now propose, would it be necessary for you to purchase and install



additional pump equipment?

A Yes, it would.

Q In other words, your 3,000 barrels a day wouldn't handle it?

A No, it would not, because we will be striving for reservoir fill-up in a considerable portion of the unit as yet depleted so that the immediate effects will be that we will inject at high rates anyway.

Q If you had to operate under 701, then after fill-up you would cut back?

A Well, this has been a problem that has bothered us considerably, to say the least. We are not sure at this time which would create the least amount of damage, whether to cut back on the injection rates and suffer vertical sweep inefficiency or to go ahead and inject at capacity rates into the injection well and try to live with what allowable that we had on the wells and pump only that amount of oil, trusting that the oil would not migrate off the unit area.

Q In case of the latter, you would probably get faster response from your offset wells?

A Well response I think would be the same because we would be injecting at maximum rates up to response time under either case.



MR. UTZ: Are there any other questions of the witness?

MR. NUTTER: Yes, sir.

BY MR. NUTTER:

Q Mr. Riley, on your Exhibit No. B in Case 2955, you show the six stages of expansion of the project?

A Yes.

Q And you testified that the expansion would be made in terms, or made in compliance with the terms of Rule 701 as far as expansion was concerned, I believe. Now, the application includes among things requested point No. 3, establishing rules for the expansion and operation of the flood within the area. Actually, do you want a provision in here to set up these stages of expansion or would you plan to expand it in accordance with 701, which would merely mean writing a letter and enclosing the casing program for the new wells and going through the usual administrative procedure to get the expansion? A hearing wouldn't be necessary but there is an administrative procedure set out in the order.

A Well, possibly our application was a little bit ambiguous in this. We had assumed that you would control the expansion by Rule 701 as you previously had. If we could get anything better than that --

Q Of course, we don't have the casing program for the additional wells.



A We certainly feel that we should have to file casing programs and et cetera.

Q So just expansion under the terms of 701-E or F, or whatever it is, --

A E, I think it is.

Q -- would be adequate then?

A Yes.

MR. NUTTER: Thank you.

MR. UTZ: Mr. Bratton.

BY MR. BRATTON:

Q Mr. Riley, basically, as I understand you, you have never agreed with the Commission's findings in promulgating Rule 701 that reasonable curtailment of production in waterflood projects does not result in a loss of ultimate oil recovery?

A That is true.

Q And that is what this application is based on, is your continued viewpoint that that finding is wrong?

A No, our plea is based on the fact that the Commission has already seen fit to grant an exception to Rule 701 to any waterflood operating prior to November 9, 1959, that is a normal expansion therefrom.

Q So, that's what the capacity allowable is based on then?

A Yes. That is our plea at this time. As to philosophy,



I still have the same philosophy, yes.

Q They've never convinced you?

A I don't think they ever will. I have seen too many waterfloods operated to believe otherwise.

Q But the capacity allowable is requested that this is a, I believe I am quoting the rule rightly, that this is a legitimate expansion of a waterflood project previously authorized, is that correct?

A Yes.

Q Actually the waterflood project previously authorized was a double five-spot, right?

A Actually it was five wells of the double five-spot with the sixth well being somewhat in question according to the testimony. Basically it was a double five-spot.

Q Actually one well missing, three wells now in this unit area, two wells outside?

A That's correct.

Q So actually you are seeking a contraction of a previous authorized project and expansion and authorization for a well that has never been authorized?

A No, I don't think I would agree contraction. Expansion, yes. We are not requesting that these two wells of Skelly's be shut in, which I think would constitute contraction.



Q Now, the Skelly wells are under R-179-B, right?

A They are all under that, basically under R-179-A, B being an amendment to 179.

Q Right applicable to the Skelly well. What you are asking now on the basis of the one five-spot, that's in this unit area, to expand that to a flood covering some 3920 acres as a capacity flood, is that correct?

A Basically, yes.

Q Was any order ever issued authorizing capacity production in the one well that's now in the project area?

A It never was, but I think definitely would be if the response would have been sufficient to require it.

Q But the only order ever authorized granting the above normal allowable was as to the Skelly well?

A I think that is correct.

Q Actually you say they started with this flood around in '56, actually it was previous to that time, or your records don't go back to when it started?

A That is correct.

Q If the Humble records indicate it was around 1953, why

A I would have to accept that, yes.

Q You don't need capacity in this project, do you, Mr. Riley, because of any equipment that you purchased prior to Rule



701, do you?

A Yes. Our pressure plant equipment was acquired prior to November 9, 1959.

Q Well, I mean what difference would capacity and not capacity make on that?

A Well, it's your question first. I might ask you what you had in mind.

Q All I am asking --

A What I mean, I'm not basing my philosophy on the fact that you have to buy big equipment or smaller. I am basing my philosophy on which promotes conservation the best.

Q The efficiency?

A The sweep efficiency, yes.

Q There are some 20,000 acres in this Langlie-Mattix, aren't there?

A Yes, according to my knowledge. Yes.

Q And you don't know of any other flood in it that is authorized at capacity?

A None to my knowledge.

Q Regardless of what the allowable determination is made here, you'll be able to use your present equipment, plus you'll have to buy additional equipment under any circumstances?

A That's correct.



Q There's no need for a capacity allowable as a buffer zone anywhere in this area, is there, Mr. Riley?

A I've never quite been able to figure out to my satisfaction how a buffer zone can be properly administered and not create some vertical sweep inefficiency.

Q So the buffer zone question is not involved here?

A I don't think it has been brought up, no.

MR. BRATTON: I think that's all.

MR. UTZ: Any other questions?

MR. DURRETT: Yes, sir, I have a question.

MR. UTZ: Mr. Durrett.

BY MR. DURRETT:

Q If I am correct, Order R-179-B authorized allowable not in excess of six times the top unit allowable for the pool, and it was further restricted by a mathematical formula multiplying the number of developed 40-acre proration units contained on the H. O. Simms lease, which was 15 times the top unit allowable for the pool. I said that backwards. Actually that 15 times the top unit allowable for the pool was the first restriction, but at any event, not to exceed six times the top unit allowable from the pool for each well. What is the possibility, if you are granted capacity allowables in this case, that you might exceed six times the top unit allowable for the pool from any one of your wells?



A That is rather difficult to say, because of the fact that we will be stage developing and we would have to make some suppositions as to how, I can conceive of how, due to length of the band across the unit for any given stage that you might be meeting the Commission's requirement to expand a portion of that before you would the other, so it's a little difficult to say.

Q Well, the point I'm making is that there is a possibility that you would exceed six times the top unit allowable for the pool from one given well?

A Oh, yes, definitely.

Q If you did that you would be, in effect, getting more allowable than was authorized under R-179-B, would you not?

A You are assuming that we were granted capacity?

Q Yes, assuming that you were granted capacity.

A Yes, that is true.

Q Then you would be, in effect, getting more than what the Commission has previously authorized for any well in this area, even under any exception?

A I think that's correct.

Q And this 179-B, I believe it was brought out on direct examination, was passed prior to Rule 701-E?

A I believe that's correct.

Q Do you feel that Rule 701-E might have indicated a



Commission policy of restricting even further the allowable to be produced from one well in floods, all floods?

A Well, as I understand the Rule 701-E, I can't speak for the Commission's intent, but if you had a sufficient number of proration units that were allowed, times 42, as I understand the orders were written that this may be produced from any well or wells. So I don't think it limits it quite as severely as you might be thinking.

MR. NUTTER: Without any per well limitation?

A That's right.

MR. DURRETT: I think that's all I have. Thank you.

BY MR. UTZ:

Q Mr. Riley, we do have a nominal flood immediately to the west and adjacent to this unit, do we not?

A According to my records, it has been applied for. Mr. Bratton might could enlighten us further on --

MR. BRATTON: That's true.

A I think it is operational.

Q Capacity flood is granted for your application, and sooner or later we'll have to face the proposition of having a capacity flood next to a 701 flood?

A That's some ways down the road according to the stage development.



MR. UTZ: Are there other questions?

MR. BRATTON: I don't have a question. I would like to state, I assume it's all right, Mr. Jennings, if the Commission takes administrative notice of the actual production record of the Simms Well No. 6. We could put on a witness and put in what they are. I believe they will reflect that the actual peak production of that well was less than 2400 barrels a month and that it only produced above 2,000 barrels a month for seven months.

A I don't have my data to look at, but I think my records reflect differently. As I stated, I was referring to memory, but would be subject to correction after looking at our data.

MR. UTZ: That is the well located in the Northeast Quarter of the Southwest Quarter of Section 34, is it not?

A I think that's correct.

MR. UTZ: I think the Commission records will reflect the production.

MR. JENNINGS: I don't think that is correct, I didn't get your description, Northeast, Southwest?

MR. UTZ: Right.

MR. JENNINGS: That's correct.

MR. UTZ: Are there any other questions?

MR. JENNINGS: Are you satisfied, Mr. Bratton, I mean with your offer?



MR. BRATTON: Sure, the Commission can take administrative notice.

MR. UTZ: The witness may be excused.

(Witness excused.)

MR. UTZ: Are there statements to be made in this case? Is that your only witness?

MR. JENNINGS: Yes, sir.

MR. DURRETT: If the Examiner please, I have a letter--

MR. UTZ: You don't have any testimony, do you, Mr. Bratton?

MR. BRATTON: No, sir.

MR. DURRETT: -- from Skelly Oil Company, stating they have no objection in Case 2954 or 2955.

MR. UTZ: Do you have a statement to make, Mr. Bratton?

MR. BRATTON: Yes, sir. We have appeared before this Commission many times objecting to exceptions to Rule 701 for capacity allowables in areas in which Humble has no interest, feeling that the moon should shine on everybody equally, we object to the granting of capacity allowables in this proposed unit area even though we are the fourth largest owner in the unit, and we believe that the project should be governed by Rule 701 just as any other project.

Looking at the legal history of the matter, of course, a

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project was authorized before Rule 701 that was a double five-spot project. Actually one well was first authorized, then additional wells were authorized and the thing went on for several years.

I believe that the testimony indicates that at best this has been an experimental project. Now it is proposed, as I view it, in effect, to divide it and turn what has been one unsuccessful five-spot flood and convert that into a 3,920-acre capacity waterflood on the basis of the provision of Rule 701, which says that capacities should be granted to legitimate expansions of waterfloods previously authorized.

One, of course, capacity was never authorized for this flood before; two, I believe if the Commission will look at the reasons given in its rule in its Order 1525 promulgating Rule 701, that the two reasons it gave for continuation of capacity allowables in projects previously authorized and operational are just not applicable here. Those findings are findings 7, 8 in Order No. 1.

They talk, one, of the constant injection rates. Well, the project that has been authorized here, as has been testified, has fluctuated widely and apparently everything has happened to it. Two, operators of waterflood projects heretofore authorized have purchased and authorized for assignment mechanical equipment designed to produce wells at capacity. That's not applicable here. We don't feel that this comes either technically, and very



definitely not within the spirit of Rule 701 as a legitimate expansion of a previously existing waterflood, and we do not feel that capacity should be authorized in this instance any more than in any instance since Rule 701 was promulgated.

MR. UTZ: Are there other statements? The case will be taken under advisement and the hearing adjourned.

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STATE OF NEW MEXICO)
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COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 15th day of December, 1963.

Ada Dearnley

Notary Public-Court Reporter

My commission expires:
June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2954-55 heard by me on 12-4, 1963.

Shirley A. [Signature]

Examiner
New Mexico Oil Conservation Commission

