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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 11, 1964

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.

Application of Continental Oil Company for
a waterflood project, Lea County, New
Mexico.

Case No. 3006

3004

3005

BEFORE: DANIEL S. NUTTER, EXAMINER.

TRANSCRIPT OF HEARING



MR. NUTTER: We will call Case 3004.

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

MR. NUTTER: We will also call 3005.

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

MR. NUTTER: Cases 3004 and 3005 will be consolidated for purposes of hearing.

MR. JENNINGS: James T. Jennings of Roswell appearing for Ambassador Oil Corporation, and we have one witness, Mr. Riley.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, Santa Fe, representing Continental Oil Company. Would you like to consolidate 3006 with this too?

MR. NUTTER: We will call Case 3006.

MR. KELLAHIN: If Mr. Jennings has no objection.

MR. JENNINGS: We have no objection.

MR. DURRETT: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico.

MR. NUTTER: Case 3006 will be consolidated. We have consolidated 3004, 5 and 6.

MR. DURRETT: Do you have a witness, Mr. Kellahin?

MR. KELLAHIN: Yes.

MR. DURRETT: If you will have the witnesses stand I'll

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swear them all at the same time.

(Witnesses sworn.)

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 and Manager of Secondary Recovery Division for Ambassador Oil Company stationed in Fort Worth, Texas.

Q Mr. Riley, have you had occasion to testify before this Commission on many occasions in the past?

A Yes, I have.

MR. JENNINGS: Mr. Examiner, are the witness's qualifications acceptable?

MR. NUTTER: They are.

Q Mr. Riley, are you familiar with the application for the approval of the Pearsall Queen Sand Unit and the unit agreement itself?

A Yes, sir, I am.

(Whereupon, Applicant's Exhibit No. 4 was marked for identification.)



Q I hand you what has been marked Exhibit 4 and ask you if you would identify that and also identify the unit area?

A Exhibit 4 is a pictorial presentation of the unit area which is included within the hashed line on the map, the area being located generally in, or partially in Section 32, Township 17 South, 32 East, and portions of Sections 4 and 5, Township 18 South, Range 32 East, Lea County, New Mexico.

Q There are approximately 960 acres in this unit?

A That is correct.

Q What types of lands are embraced therein, Mr. Riley?

A Approximately 75% of United States federal lands, and the remainder is state land.

Q Under the terms of the unit agreement, who is the operator?

A Ambassador Oil Corporation has been selected as initial unit operator.

Q Do you have full authority to carry out the terms and operations and development under the unit agreement?

A Yes, it was stipulated in the unit agreement.

Q Is the unit agreement substantially in the same form as has heretofore been approved by the Commissioner of Public Lands and the Oil Conservation Commission and the United States Geological Survey?



A Yes, it is.

Q Do you feel that the proposed secondary recovery operations can be more efficiently and economically carried out under the terms of the unit agreement?

A Yes, I do.

Q Will this lead to the maximum recovery?

A It should.

Q What percentage of the operators of the working interest owners now have approved the working unit agreement?

A We have slightly in excess of 76% of the working owners ratified the documents, the remainder have verbally agreed and are in the process of sending them in to us. Approximately 75% have ratified the unit documents. The remainder of the royalty interests are being secured at this time.

Q Will the interest that you have qualified or have indicated their intention to qualify meet the requirements of the unit agreement?

A Yes, it will.

Q Have you requested approval by the United States Geological Survey?

A Yes, we have.

(Whereupon, Applicant's Exhibit No. 5 was marked for identification.)



Q I hand you here what has been marked as Exhibit 5 and ask you to identify that.

A Exhibit 5 is a letter from the United States Department of Interior dated August 26, 1923 wherein the acting director gave tentative approval to the unit area and designated it as one logical for unitization.

Q Have you made an application for approval to the Commissioner of Public Lands?

A Yes, we have.

Q Please refer to Exhibit 6, Mr. Riley, and identify that, please.

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

A Exhibit 6 is a letter dated August 22, 1963 wherein the unit supervisor of the unit division approved the unit agreement as to form and content.

Q Do you feel that the proposed unit will lead to a more efficient and orderly development of the proposed waterflood project?

A Yes, sir, it will.

Q Do you think that it is necessary to allow you to completely develop the project?

A Yes, I do.



Q Within thirty days after the effective date of the unit will you furnish the Commission an executed or original counterpart of the agreement?

A We will.

MR. JENNINGS: For the record I would like to state that we will not offer a unit agreement, but there is a copy attached or furnished with the application.

Q Mr. Riley, do you propose to initiate a waterflood project in connection with the unit?

A Yes, we do.

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

Q Please refer to Exhibit 1 and outline the proposed project and delineate the injection wells and give the location of the wells.

A Exhibit 1 is an areal map showing the area in excess of two-mile radius of the subject unit. The unit boundary has been inserted, the red pencil, and the proposed injection well including the Continental well have been circled in red. The proposed unit injection wells would be wells identified as 9-1 located in the Northeast Quarter of the Southeast Quarter, Section 5, Township 18 South, Range 32 East; Well 4A-1, located in the Southwest Quarter of the Northwest Quarter, Section 4, Township 18 South,



Range 32 East; Well 4-2 located in the Northeast Quarter of the Northwest Quarter, Section 4, Township 18 South, Range 32 East; Well 1-2 located in the Southwest Quarter of the Northeast Quarter, Section 5, Township 18 South, Range 32 East; and Well 3-1 located in the Northeast Quarter of the Northeast Quarter of Section 5, Township 18 South, Range 32 East.

(Whereupon, Applicant's Exhibit No. 2 was marked for identification.)

Q Referring to what has been marked Exhibit 2, would you outline the proposed pilot area?

A Exhibit 2 is also a map showing the unit boundary within the hashed line, the proposed pilot injection wells are wells encircled in a solid line and joined with a solid line.

Q Does this show the proposed plan of development?

A It shows the expanded plan of development wherein the wells to be converted at a later date are encircled with a solid line and joined with a dashed line. This is also presented in Exhibit 4.

Q Exhibit 4 being a large map?

A Being a larger map of Exhibit 2, yes.

Q What zone do you propose to flood and what zone is covered by the unit agreement?

A We propose to flood the Queen zone, which is the middle



section of the Queen, and it is the zone unitized in the document unit agreement and is stipulated in the definition of the unitized formation.

Q Referring back to Exhibit 2, does it reflect the producing wells?

A Yes, it does. They are the wells conventionally designated with the well designation of the circle.

Q What is the general condition of the production from these wells at this time?

A Most of the wells are at or below economic limit, with the exception of two wells, the J. M. Beard Pearsall Federal 1 and the Jackson Federal No. 1. The Beard well is producing approximately ten barrels a day and the Jackson Federal is slightly below allowable. They were later-drilled wells in the reservoir and have not yet depleted that small section of the reservoir.

Q The Jackson well is located in the South Half of the Northeast Quarter of Section 4?

A That is true, and the Beard well in the Northwest of the Northeast of Section 4.

Q Mr. Riley, are there any floods in the immediate area?

A The only water injection program that to my knowledge is being conducted in the Maljamar Pool to the north some three or four miles.



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Q From your study of the matter and your experience, do you feel that waterflooding will be feasible and will result in an increased ultimate recovery in this area and prevent waste?

A Yes, it should.

Q What type of water do you propose to inject, Mr. Riley?

A Our plans contemplate attempting to secure shallow water production which should be relatively brackish in the unit area. If we're unsuccessful we will purchase water from a water company in the area.

Q What quantities do you propose to inject?

A We anticipate that the injection rate should be in the order of 500 barrels per well per day.

Q Did you furnish the office of the State Engineer with a copy of your application and have you heard from the State Engineer concerning the application?

A Yes, we did notify the State Water Engineer and in a letter dated February 28, 1964, said letter being included in the exhibits as Exhibit 7, he approved our plan of operations.

(Whereupon, Applicant's Exhibits Nos. 3 & 7 were marked for identification.)

Q Please refer to Exhibit 3 and outline your proposed casing program.

A Exhibit 3 is a diagrammatic sketch of the casing programs



and Wells 1-2, 3-1, 4-2 and 4A-1 and 9-1 wherein it shows that the wells have approximately a thousand feet in excess of surface pipe with the exception of 9-1 and all wells have production strings to approximately 35 to 3600 feet. Our plan of injection is to utilize tubing and packer and to inject through these.

Q Mr. Riley, please refer to what has been marked as Exhibit A and identify that and state briefly what it reflects. Exhibit 8, excuse me.

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

A Exhibit 8 is a general waterflood application sheet carrying geological and engineering information on the proposed unit.

Q What is the general depth of the area?

A The general average depth of the top of the pay to be flooded is 3650 feet. Do you want me to give other information from this exhibit or not?

Q You might give any reservoir characteristics that you might have.

A Average effective pay thickness has been estimated at 15 feet, with average porosity approximately 11%, average estimated horizontal permeability 15, with a range from 10 to 60; connate water content, 32% of pore space, gravity of the oil is 36 degrees



API and the viscosity is unknown.

The unit area has produced approximately 900,000 barrels of oil to the date of the application and we anticipate that we will recover an equal amount under secondary recovery.

Q Are there other proposed flood projects or pilot projects in the area, Mr. Riley?

A Continental Oil Company has tentatively entered into a cooperative line agreement wherein they will convert that Pearsall A. K. Federal Well No. 2, located in the Southwest of the Southwest of Section 33, Township 17 South, Range 32 East. This well is contemplated to be as one of the six pilot injection wells.

Q Do you have anything further that you wish to offer to the Commission concerning the ultimate recovery or the feasibility of this project?

A No, I do not.

Q Mr. Riley, were what has been identified as Exhibits 1, 2, 3, 4 and 8 prepared by you or at your insistence and under your instruction?

A Yes, they were.

Q Are Exhibits 5, 6 and 7 copies of letters which you received?

A Yes, they are.

MR. JENNINGS: We would offer Exhibits 1 through 8.



MR. NUTTER: Ambassador's Exhibits 1 through 8 are admitted in evidence.

(Whereupon, Applicant's Exhibits 1 through 8 were offered and admitted in evidence.)

MR. JENNINGS: We have nothing further.

MR. NUTTER: Does anyone have any questions of Mr. Riley?

MR. DURRETT: Yes, sir.

CROSS EXAMINATION

BY MR. DURRETT:

Q Mr. Riley, I believe that you indicated that the wells in the project area that you have discussed were stripper wells. I didn't get the production figures. Do you have an average production that they have been making in the past?

A As shown on Exhibit 8, I believe the average daily oil production per well is seven barrels, with the range that I mentioned previously of essentially half a barrel to slightly below allowable for the one well in the eastern edge of the reservoir.

Q That good well was either this Jackson well or the Beard?

A The Jackson well, that is true. It was drilled approximately four years ago and we're not, that small sector of the reservoir has not been drained as yet.

Q Do you expect it to get a response from your flood?

A I would think so.



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

BY MR. NUTTER:

Q On Exhibit 8 you mentioned there were 14 producing wells in the project area. Just which wells are those 14?

A Referring to Exhibit 4, those would be the Yates State 1 and 3, the Ambassador Federal AA, Tract 1-1 and 2, the Federal AA Tract No. 2, Well No. 1, the Reading and Bates Shaw Federal B-1, the Jackson Federal No. 1, the Beard Pearsall Federal No. 1 and in Section 5, Ambassador Federal B, B-1 and 2, Federal C, C-1 and 2, D, D-1, E, E-1, F, F-2, Z-1 and the Shaw Federal No. 1. Is my count wrong there?

Q I had counted 17 previously and I get 17 again. I was wondering, perhaps, if some of the wells off on the Northwest might not be considered in the project area at this immediate time.

A That is true.

Q And was the reason they were left out.

A The wells I named were in the unit area, that's right, in the project area there are 14.

Q What did you say the Beard Pearsall Federal --

A Approximately ten barrels to the best of my knowledge.

Q And the Jackson is just slightly less?

A Slightly less than allowable.

Q How about your AA Tract 1 No. 2, that's going to be



converted, what's it capable of producing?

A It's presently producing only about three barrels a day.

Q With reference to the unit agreement, what percentage of the working interest ownership did you say was committed?

A Slightly in excess of 76%, but I personally contacted each of the remaining working interest owners and they assured everything was all right and it was just a matter of getting them signed and sent back to us.

Q So you expect to have 100% of the working interest?

A 100%, that is true.

Q Are there any fee lands in here?

A No fee lands.

Q Is injection in each instance to be down tubing over a packer?

A That's correct.

Q Or under a packer?

A That is correct.

MR. NUTTER: Any further questions of Mr. Riley? He may be excused.

(Witness excused.)

MR. NUTTER: Did you have anything further, Mr. Jennings?

MR. JENNINGS: We have nothing further.

MR. NUTTER: Mr. Kellahin.



MR. KELLAHIN: Yes, sir.

(Whereupon, Applicant's Exhibits
Nos. 1 through 4 were marked
for identification.)

VICTOR T. LYON

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Victor T. Lyon, L-y-o-n.

Q By whom are you employed and in what position?

A I am employed by Continental Oil Company as Senior
Engineer in the Hobbs District Office, located in Hobbs, New
Mexico.

Q Have you ever testified before the Oil Conservation Com-
mission and made your qualifications a matter of record?

A Yes, sir.

MR. KELLAHIN: Are the witness's qualifications accept-
able?

MR. NUTTER: They are.

Q Are you familiar with the application of Continental Oil
Company in 3006 which has been consolidated for the purposes of
the hearing with Ambassador's Cases 3004 and 3005?



A Yes, I am.

Q What is proposed by Continental in this application?

A This is the application of Continental Oil Company for permission to inject water into our Pearsall A. X. Well No. 2 located 660 feet from the South line and 660 feet from the West line, Section 33, Township 17 South, Range 32 East, in Lea County, New Mexico.

Q Referring to what has been marked as Exhibit No. 1, would you identify that exhibit and discuss the information shown on it?

A Yes, sir. Exhibit No. 1 is a location and ownership plat showing the Ambassador Pearsall Queen Sand Unit which is outlined in green and Continental Oil Company's cooperative water-flood project area outlined in red. This area consists of all of Section 33 and the West Half of the Northwest Quarter of Section 34 in Township 17 South, Range 32 East. The proposed injection well, Pearsall A. X. Well No. 2 is circled in red.

Q Has the Pearsall area operated by Continental been unitized as yet?

A No, sir, this is a block of federal acreage which we have not unitized, but inasmuch as the federal government is the primary royalty owner we feel can be unitized in a short period of time when the unit is, when the project is ready to be expanded.



Q Now, referring to what has been marked as Exhibit No. 2, would you identify that exhibit and discuss the information on it?

A Yes, sir. Exhibit No. 2 is a schematic diagram showing the tubular goods employed in the well and the cementing information. It shows the depth of casing and the size and setting depths of the tubing and packer to be employed. We propose to inject water into the open hole interval from 3439 to 3647 feet.

Q Is that the same type of completion that will be used by Ambassador in their portion of the injection program?

A Yes, sir, it is.

Q Will the packer be pressure tested?

A Yes, sir, it will be pressure tested before injection is commenced.

Q Have you prepared some information sheets showing information on the waterflood project?

A Yes, sir. Exhibit No. 3 is a data sheet showing essentially the same information introduced by Ambassador in Case 3005. It has been modified to apply to our project area where this was necessary. I have added to this exhibit two sheets in addition to those submitted with the application which are decline curves of the pool area and of Continental project area and of the Pearsall A. X. Wells Nos. 1 and 2.

Q At this time would you consider the area as substantially



depleted on primary recovery?

A Yes, sir. Our proposed injection well is our best well and it has been producing approximately three barrels per day.

Q Referring now to what has been marked as Exhibit No. 4, would you discuss that exhibit, please?

A Exhibit No. 4 is a location and ownership plat showing in greater detail the project area. The proposed injection wells are shown by the red triangles and are connected by solid lines. The possible expansion of the project shows the possible injection wells by the triangles and connected by dashed lines.

Q Is that exhibit in agreement with the proposal that was submitted by Ambassador?

A It is so far as the injection wells are concerned. I'd like to point out that there are two instances where the Ambassador unit boundary is in error in that.

Q You mean in error on your exhibit or their exhibit?

A On our exhibit. On this Exhibit No. 4. The draftsman had not made this change when I came up here, but it shows, well, it should be corrected by adding the Southeast Quarter of the Northeast Quarter of Section 4 and the Southwest Quarter of the Southeast Quarter of Section 5. This would make it agree with our Exhibit No. 1 and Ambassador's exhibits.

Q Have you anything further to add to your testimony, Mr.



Lyon?

A Well, as stated in this application, this is a cooperative project and since they are, well, these hearings have been consolidated, but the water which we will inject into our well will be the same water and out of the same system as that injected in Ambassador's wells. We have an agreement which is almost completely worked out whereby this can be done.

Q The testimony that was given in behalf of Ambassador in regard to the economics of this operation and the recoveries that might be expected would apply to your portion of the project too, would it not?

A Yes, sir.

Q Do you request that future expansions of the project be permitted by administrative approval as provided by Rule 701?

A Yes, we do.

Q Were Exhibits 1 through 4, inclusive, prepared by you or under your supervision?

A Yes, sir, they were.

MR. KELLAHIN: At this time we would like to offer in evidence Exhibits 1 through 4.

MR. NUTTER: Continental's Exhibits 1 through 4 will be admitted in evidence.

(Whereupon, Continental's Exhibits 1 through 4 were offered and admitted in evidence.)



MR. KELLAHIN: That completes the direct examination of the witness.

MR. NUTTER: Any questions of Mr. Lyon?

MR. IRBY: Frank Irby, State Engineer's Office.

MR. NUTTER: Mr. Irby.

CROSS EXAMINATION

BY MR. IRBY:

Q When you expand this, Mr. Lyon, will the well construction and equipment on the additional wells used for injection be the same as in this Pearsall A. X. No. 2?

A I think essentially they will be the same. To my knowledge we will inject through tubing under a packer.

Q And this, if this isn't the case, you will notify me?

A Yes, sir.

Q Please. I believe that Ambassador said they were going to use lined tubing, is this true in your case?

A I'm not certain of that, Mr. Irby. It probably will depend on the quality of water that will be available. To my knowledge we don't have any present plan of using lined tubing.

Q You do intend to recircle any produced water, do you not?

A Yes, sir. In the event of water breakthrough and continued operation, we will almost certainly use the produced water for injection purposes.



MR. IRBY: Thank you.

BY MR. NUTTER:

Q On your data sheet you showed four wells in the project area, which would those four producing wells be?

A These are the total producing wells from this pool in the project area and that includes the Pearsall A. X. Wells No. 1 and 2, and the Pearsall A Numbers 9 and 10. Those wells are located in Units E, F, L and M, Section 33.

Q Is it your intent to reenter and examine No. 3?

A Yes, sir. We anticipate that we will reenter No. 3 within 60 to 90 days after the commencement of water injection in No. 2.

Q Has that well actually been plugged?

A I don't believe so.

Q Does it have casing in it?

A I believe it does. I have a report here that should give me the answer.

Q You might look up 16 while you are at it.

A I'm not certain of the casing program in those two wells, but I believe that the casing is still in place.

Q Do you know if either one of those two wells has produced in the past?

A Yes. I'm not certain that this is given in here, but



it's my understanding that No. 3 has produced and No. 16 was abandoned after testing.

Q On completion?

A It was drilled at an early date and was before we had available stimulation methods that are available today, and it did not produce.

Q You ultimately plan to use No. 16 as an injection well, don't you?

A Yes, sir.

Q It's our pattern?

A Yes, sir.

Q At any rate, prior to putting No. 3 and No. 16 in operation a casing program similar to the injection --

A Excuse me.

Q --injection Well No. A. X. 2 would be utilized, is that a fair assumption to make?

A I found the information that you requested, Mr. Nutter, 2,612 feet of 7" casing has been pulled from Pearsall A. X. No. 3. Prior to injecting we will adequately case the well either with a full length casing string or with a casing bowl so that the casing will be adequate.

Q Well No. 3 will be a producing well. How about No. 16, do you have the data on it?



A Yes, sir. Surface casing only was set in No. 16, and it has been plugged with what appears to be an acceptable plugging program which we normally use with the Commission's consent. It will have to be redrilled or the plugs drilled out and casing set.

MR. NUTTER: Thank you. Are there any other questions of Mr. Lyon? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Kellahin?

MR. KELLAHIN: Nothing further.

MR. NUTTER: Does anyone have anything they wish to offer in Case 3004, 3005 or 3006? We will take the cases under advisement and recess the hearing until 1:30.

(Whereupon, a recess was held until 1:30 P.M.)



STATE OF NEW MEXICO)
) SS
 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 3rd day of April, 1964.

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. 3004-5-6 heard by me on 3/11, 1964.
Donna Examiner
 New Mexico Oil Conservation Commission

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