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BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
August 24, 1966

Application of Mobil Oil Corporation for  
a unit agreement, Eddy County, New  
Mexico

and

Application of Mobil Oil Corporation for  
a waterflood project, Eddy County, New Mexico.

CASE NUMBER  
3443

CASE NUMBER  
3444



cases will be consolidated for the purpose of the hearing.  
Separate orders will be written on the cases.

Are there any other appearances in this case?

There are none. You may proceed.

ROBERT WHITE

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

DIRECT EXAMINATION

BY MR. JIM SPERLING:

Q State your name, please, sir, your residence, your  
occupation, by whom you are employed.

A My name is Robert W. White. I live in Midland, Texas.  
I am a Senior Production Engineer for Mobil Oil Corporation.

Q Have you testified before the Commission on previous  
occasions in those capacities?

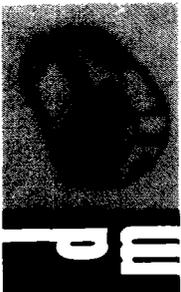
A Yes, I have.

Q Your qualifications are then a matter of record before  
the Commission?

A Yes, that's true.

Q Mr. White, you are familiar with the application filed  
by Mobil Oil Corporation in Case Number 3443 which requests  
approval of unit agreement for the Northeast Square Lake Premier  
Unit, Eddy County, New Mexico, is that correct?

A Yes, sir, I am.



Q Would you briefly describe the unit agreement, its provisions, the ownership, percentage of sign up by the interest owners and whether or not the unit agreement has been submitted to and received approval by or tentative approval by the regulatory agencies, who have jurisdiction over these lands and leases.

A The unit agreement is the usual form comprising Federal and State lands. As of this date, we have seventy-three point six percent of the working interest owners signed. The agreements have been submitted to the State Land Office and the U.S.G.S. and we have received their preliminary approval on the agreement.

Q Would you tell us in general what the unit agreement provides with reference to operation and with reference to participation by tracts in production in phase one and phase two as described in the unit agreement?

A The participation under the unit will be divided into two phases. Phase one will be based ninety percent on a tract's current production fraction plus ten percent on the tract's remaining primary fraction. Phase one will remain in effect from the effective date of the until until oil production from the unit area after November 1, 1965 equals 57,300 barrels.

Phase two participation is based sixty percent on the tract's ultimate primary recovery fraction plus forty



percent of the tract's acre feet fraction.

Q You stated, I believe, that the actual execution of the agreement has been accomplished by seventy-three percent plus of the interest owners?

A Yes, that is the **working** interest owners in phase two.

Q Do you anticipate one hundred percent execution of the agreement?

A Yes. We anticipate one hundred percent commitment of the tracts shown in the unit area.

Q You have received no objection from any parties owning interest within the unit area?

A That's true.

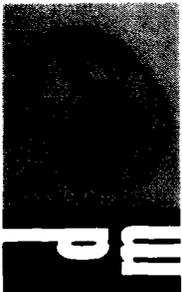
MR. SPERLING: Does the Examiner have any questions with reference to the unit agreement portion of the hearing?

MR. UTZ: I have none. Are there questions?

Proceed.

Q (By Mr. Sperling) Now, I will refer you, Mr. White, to what has been marked as Exhibit Number One, Case Number 3444, and ask you to describe what it portrays.

A Exhibit One is the lease map of the area which shows the unit boundary and all wells and leases within a two-mile radius of the proposed waterflood. The unit area will consist of 2200 acres more or less in Sections two, three, four, nine, ten, and eleven, of Township 16 South, Range 31 East, Eddy



County, New Mexico.

Q This is the same unit area as described and shown in exhibit form in the unit agreement concerning which you have already testified?

A Yes, it is.

Q Now, the application which has been filed in 3444 requests the authority of the Commission to institute a water-flood project by injecting water into the Premier Basal Grayburg formation within the area which you have just described. Would you tell the Examiner what your plans are now with reference to the injection rates, and so forth?

A Yes. Exhibit Two is a waterflood pattern map which shows the proposed development. It is proposed to initially inject at a total rate of 3,500 barrels of water per day into fourteen injection wells which have the symmetry of a five spot pattern. The well head pressure after about fifty per cent fill up is anticipated to be approximately 2,000 pounds. Injection equipment is designed for working pressures of approximately 2,200 pounds. All injection facilities will be internally coated.

Q Now the Exhibit Two to which you have referred shows the location of the proposed injection as well as producing wells?

A Yes, it does.



Q And also indicates the unit area which, I believe, you have already described?

A Yes, it does.

Q Now would you please refer to Exhibit Three?

A Exhibit Three is a sonic log of the Oscar Bar E Drilling Company, State Number One. On this log we have shown the unitized formation which is the premier sand. On this log the top of the premier is found at 3,926 feet below the derrick floor and the base is 3,976 feet. This log depicts typical premier sand development within the unit boundary.

Q Now you described the log as typical of the sand development within the unit area as shown by logs on other wells?

A Yes, sir.

Q Would you refer to Exhibit Four through Seventeen now which are diagrammatic sketches of the proposed completions.

A Exhibits Four through Seventeen shows the injection well completion data. On these exhibits, the surface casing, oil string, tubing, and cement tops are shown on each proposed injection well. The injection will be through corrosion protected tubing below tension packers. In each case the packer will be set right above the top premier formation. On all diagrams there is a minimum of 600 feet of the calculated cement top above the proposed packer seats.

MR. UTZ: May I interrupt and ask a question here?



I think this is a drafting error. On all of these your eight and five-eighths has an arrow pointing to the smaller casing. That is an error, isn't it?

A Yes, that is a drafting error.

MR. UTZ: All right, proceed.

Q (By Mr. Sperling) What is your proposed water source for injection?

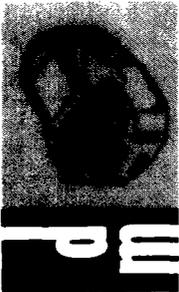
A Water will be purchased from the Double Eagle Corporation.

Q And what disposition will be made of produced water?

A As soon as produced water becomes available, it will be injected into the waterflood pattern.

Q Would you describe what the unit area's current production is, where wells are on producing status or what their status may be?

A Unit area production for April, 1966, was 2,202 barrels of oil from twenty-three producing wells, which is an average daily production of four barrels per well per day. There are three shut in wells and three temporarily abandoned wells in addition to the producers within the unit boundary. The unit area has reached the advanced stage of depletion and it is requested that the project be operated under the provisions of the Commission Rule Number 701E related to waterflood projects in the establishment of allowable in accordance therewith.



Q Mr. White, is it anticipated that the unit area will be expanded?

A No, it is not anticipated that the unit area will be expanded. There are some undrilled locations within the unit boundary which will likely be drilled at a later date.

Q What disposition do you propose to make of the three shut in wells and the three temporarily abandoned wells?

A The three shut in wells will be utilized in the pattern, either as injectors or producers as previously shown.

Q Has a copy of this application with the pertinent exhibits been submitted to the Office of the State Engineer of New Mexico.

A Yes, it has.

Q Have you seen a copy of a letter dated July 27th, 1966, addressed to the Secretary-Director of the Oil Conservation Commission in Santa Fe and signed on behalf of S. E. Reynolds, the State Engineer, by Frank Irby, the Chief, Water Rights Division?

A Yes, sir, I have.

Q In that letter, he requests that the Commission be assured that the tension packers which are shown on Exhibits Four through Seventeen are properly set well below the top of the cement surrounding the casing, which has previously been used as production string. Can you give the Commission that assurance?

A Yes, that will be done.



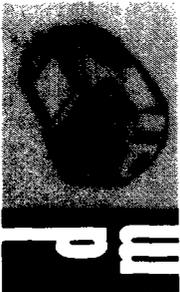
MR. SPERLING: If the Examiner please, I assume that the original of this letter is in the file and we would ask that it be made a part of the record in view of Mr. White's last statement.

MR. UTZ: It is in the file and will be made a part of the record in this case.

Q (By Mr. Sperling) Mr. White, do you have any data indicating reservoir characteristics and other pertinent information that should be made a part of the record in this case with reference to this unit area?

A Yes. The accumulative oil production from the unit area was 606,000 barrels as of May 1st, 1966. The remaining primary oil is estimated to be approximately 40,000 barrels as of May 1st, 1966, which means that approximately ninety-four percent of recoverable oil by primary drive has been produced. The increased recovery from the proposed waterflood is estimated to be approximately 1,000,000 barrels of oil.

The basic reservoir data may be summarized as follows: Developed area 1,080 acres. Average pay thickness, seven feet. Average porosity, sixteen percent. Connate water saturation, thirty-two percent. Average air permeability, nineteen millidarcies. Original solution gas oil ratio, 295 standard cubic feet per barrel. Original bottom hole pressure 1,200 P.S.I. Current bottom hole pressure is estimated at approximately



100 P.S.I.

Q When do you propose to initiate injection, assuming the approval of the application?

A The material and equipment will be ordered as soon as approval is received and we anticipate to have water started in the ground within about six months.

Q Is there anything else that you would like to add to your testimony, Mr. White?

A No, sir, there isn't.

MR. SPERLING: At this time I would like to offer Exhibit Number One in Case 3443 and Exhibits One through Seventeen in Case Number 3444.

MR. UTZ: The Exhibits mentioned will be entered into the record of these cases without any objection.

MR. SPERLING: That's all I have at this time.

MR. UTZ: Did you state what the highest production was on the wells in this unit?

A The highest?

MR. UTZ: Yes, sir. You say a four barrel average.

A It ranges from ten to fifteen barrels per well for the top producer.

MR. UTZ: I noted on your diagram here of your injection well that the top of the cement is down in the neighborhood of 300 to 400 feet on a number of wells. Do you know



anything about the fresh water situation in that area?

A No, sir, I am not familiar with the fresh water basin as it is. Part of these wells are on the Caprock and part of them are off the Caprock so they are both within and without of the basin.

MR. UTZ: I believe we only have three wells in that category and that would be number five, six and ten. Are those wells in the basin or not?

A No, sir. They are not. They are on the western edge of the unit and we feel that the other things that we have done adequately protects the fresh water formations and will confine the injected water to the desired interval.

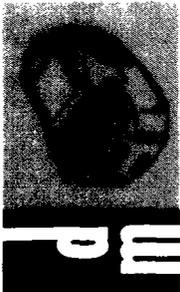
MR. UTZ: And all of your injection equipment will be lined?

A Yes.

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

MR. SPERLING: In connection with the Examiner's question concerning the fresh water and his last question relating to protective measures taken, I also understand that you intend to use corrosion inhibited water in the casing tubing annulus.

A Yes, sir, that is correct. These will be filled -- the annulus will be filled with inhibited water when the wells are completed.



MR. UTZ: What is your water source? Did you state that?

A Yes. It will be purchased from the Double Eagle Corporation of New Mexico.

MR. UTZ: Are there other questions?

(No response.)

The witness may be excused.

(Witness excused.)

Are there other statements in this case or these cases?

MR. HATCH: The letter from Standard Oil Company of Texas dated August 8th, 1966, addressed to the New Mexico Oil Conservation Commission. "Gentlement: The application of Mobil Oil Corporation for authority to waterflood the Northeast of Square Lake Premier Unit, Eddy County, New Mexico, is to be heard August 24, 1966. Chevron Oil Company, an owner of interest within the unit, urges Commission approval of Mobil's application." Signed, "C. N. Setnar, Chief Engineer."

MR. UTZ: The cases will be taken under advisement.

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