

CASE 4440: Application of MORAN
OIL PRODUCING & DRIG. CORP. FOR
A WATERFLOOD PROJECT, LEA COUNTY.

Case. Number.

4440

Application,
Transcripts.

Sm all Exhibts.

ETC.

OIL CONSERVATION COMMISSION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

November 3, 1970

Mr. James T. Jennings
Jennings, Christy & Copple
Attorneys at Law
Post Office Box 1180
Roswell, New Mexico 88201

Dear Sir:

Reference is made to Commission Order No. R-4050, recently entered in Case No. 4440, approving the Moran Hobbs Rice Waterflood Project.

Injection shall be through the one authorized water injection well which shall be equipped with a string of tubing set in a packer located as near as is practicable to the casing shoe. The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 168 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

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Mr. James T. Jennings
Jennings, Christy & Copple
Attorneys at Law
Post Office Box 1180
Roswell, New Mexico 88201

November 3, 1970

C Your cooperation in keeping the Commission so informed as to the
status of the project and the wells therein will be appreciated.

Very truly yours,

O
A. L. PORTER, Jr.
Secretary-Director

P ALP/DSN/ir

cc: OCC-Hobbs, New Mexico

Y Mr. D. E. Gray
State Engineer Office
Santa Fe, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 4440
Order No. R-4050

APPLICATION OF MORAN OIL PRODUCING
& DRILLING CORPORATION FOR A WATER-
FLOOD PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:30 a.m. on October 14, 1970, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 2nd day of November, 1970, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Moran Oil Producing & Drilling Corporation, seeks authority to institute a pilot waterflood project in the Hobbs Pool by the injection of water into the Grayburg formation through its Rice Well No. 4 in the NW/4 NE/4 of Section 13, Township 18 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That the applicant further seeks an administrative procedure whereby said project could be expanded to include additional injection wells in the area of the said project as may be necessary in order to complete an efficient injection pattern; that said administrative procedure should provide for administrative approval for conversion to water injection in exception to the well response requirements of Rule 701 E-5 of the Commission Rules and Regulations.

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CASE No. 4440

Order No. R-4050

(4) That the wells in the proposed project area are in an advanced state of depletion and should properly be classified as "stripper" wells.

(5) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(6) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations; provided however, that the showing of well response as required by Rule 701 E-5 should not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

IT IS THEREFORE ORDERED:

(1) That the applicant, Moran Oil Producing & Drilling Corporation, is hereby authorized to institute a pilot waterflood project in the Hobbs Pool on its "Rice" Lease in the NE/4 of Section 13, Township 18 South, Range 37 East, NMPM, Lea County, New Mexico, by the injection of water into the Grayburg formation through its Rice Well No. 4, located in the NW/4 NE/4 of said Section 13, and the project is hereby designated the Moran Hobbs Rice Waterflood Project.

(2) That the Secretary-Director of the Commission may approve the institution of an additional waterflood project in the Hobbs Pool on the applicant's "B" Lease in the NW/4 of Section 18, Township 18 South, Range 38 East, NMPM, Lea County, New Mexico, upon the completion of a water injection well for said pool on said lease.

(3) That the above-described waterflood projects shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations;

PROVIDED HOWEVER, that the Secretary-Director of the Commission may approve expansion of the above-described waterflood projects to include such additional injection wells in the areas of said projects as may be necessary to complete efficient water injection patterns; that the showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

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CASE No. 4440

Order No. R-4050

(4) That monthly progress reports of the waterflood projects herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



DAVID F. CARGO, Chairman



ALEX J. ARMIJO, Member



A. L. PORTER, Jr., Member & Secretary



esr/

ROUGH DRAFT FOR WATERFLOOD LETTERS

Mr. James T. Jennings
Jennings, Christy, & Copple
Attorneys at Law
Post Office Box 1180
Roswell, New Mexico 88201

Dear Sir:

Enclosed herewith is a copy of the
Commission Order No. R-4050, recently
4440, approving the Moran Hobbs Rice
Waterflood Project.

Injection shall be through the one
authorized water injection well which
shall be equipped with a string of tubing
set in a packer located as near as is
practicable to the casing shoe. The casing tubing
annulus shall be loaded with an inert fluid
and equipped with a pressure gauge at the surface

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 162 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

cc: OCC: Hobbs X
Artesia
Aztec

USGS

~~Mr. Frank Irby~~, State Engineer Office, Santa Fe, New Mexico
Mr. D. E. Gray



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

P. O. BOX 2088 - SANTA FE

87501

GOVERNOR
DAVID F. CARGO
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

November 2, 1970

Mr. James T. Jennings
Jennings, Christy, & Copple
Attorneys at Law
Post Office Box 1180
Roswell, New Mexico 88201

Re: Case No. 4440
Order No. R-4050
Applicant:
Moran Oil Producing & Drilg.

Dear Sir:

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

Very truly yours,

Very truly yours,
A. L. Carter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
 Artesia OCC
 Aztec OCC
 State Engineer x

Other _____

DOCKET: REGULAR HEARING - WEDNESDAY - OCTOBER 14, 1970

OIL CONSERVATION COMMISSION - 9 A.M. - MORGAN HALL, STATE LAND OFFICE BUILDING,
SANTA FE, NEW MEXICO

ALLOWABLE: (1) Consideration of the oil allowable for November and December, 1970;

(2) Consideration of the allowable production of gas for November, 1970, from fifteen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico. Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for November, 1970.

CASE 4436: (THIS CASE WILL BE HEARD BEFORE THE FULL COMMISSION OR BY EXAMINER DANIEL S. NUTTER)

Application of El Paso Natural Gas Company for the amendment of the General Rules and Regulations governing the prorated gas pools of New Mexico and the amendment of the Special Rules and Regulations governing the Tapacito-Pictured Cliffs and Basin-Dakota Gas Pools located in Rio Arriba, San Juan, and Sandoval Counties, New Mexico. Applicant, in the above-styled cause, seeks the amendment of the General Rules and Regulations governing the prorated gas pools of Northwest and Southeast New Mexico and the Special Rules and Regulations governing the Tapacito-Pictured Cliffs and Basin-Dakota Gas Pools located in Rio Arriba, San Juan, and Sandoval Counties, to permit substantial changes in the method of classifying marginal wells, and the assignment of allowable to marginal wells governed by the aforesaid rules and regulations, as well as a substantial change in the balancing of production procedure required by said rules. Copies of the proposed amendments will be circulated by way of the Commission's general mailing list and will be available upon request made to the Commission at its Santa Fe office.

* * * * *

THE FOLLOWING CASES WILL BE HEARD BEFORE DANIEL S. NUTTER, EXAMINER, OR ELVIS A. UTZ, ALTERNATE EXAMINER, IN THE OIL CONSERVATION COMMISSION CONFERENCE ROOM ON THE SECOND FLOOR OF SAID BUILDING AT 9:30 A.M.

CASE 4437: Southeastern New Mexico nomenclature case calling for the creation, abolishment and extension of certain pools in Lea and Roosevelt Counties, New Mexico.

(a) Create a new pool in Lea County, New Mexico, classified as an oil pool for Wolfcamp production and designated as the East Corbin-Wolfcamp Pool. The discovery well is the Phillips Petroleum Company Lea No. 23 located in Unit P of Section 30, Township 17 South, Range 34 East, NMPM. Said pool would comprise:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
SECTION 30: SE/4

(Case 4437 continued)

(g) Extend the Townsend-Morrow Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 16 SOUTH, RANGE 35 EAST, NMPM
SECTION 8: SW/4

(h) Extend the Tres Papalotes-Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 34 EAST, NMPM
SECTION 34: NW/4

(i) Extend the Tulk-Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 South, Range 32 East, NMPM
SECTION 33: SE/4
SECTION 34: S/2

CASE 4438: Application of Eastland Oil Company for an exception to Order No. R-3221, as amended, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Order No. R-3221, as amended, which order prohibits the disposal of water produced in conjunction with the production of oil on the surface of the ground in Lea, Eddy, Chaves and Roosevelt Counties, New Mexico, after January 1, 1969. Said exception would be for applicant's leases comprising the NW/4 NW/4 of Section 5 and the NE/4 NE/4 of Section 6, Township 18 South, Range 31 East, Grayburg-Jackson Field area, Eddy County, New Mexico.

CASE 4439: Application of Shenandoah Oil Corporation for an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox Pennsylvanian well location 1980 feet from the South line and 660 feet from the West line of Section 22, Township 6 South, Range 27 East, undesignated Pennsylvanian gas pool, Chaves County, New Mexico. The S/2 of said Section 22 to be dedicated to the well.

CASE 4440: Application of Moran Oil Producing & Drilling Corporation for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pilot waterflood project in the Hobbs Pool by the injection of water into the Grayburg formation through one well located in the NW/4 NE/4 of Section 13, Township 18 South, Range 37 East, Lea County, New Mexico. Applicant further seeks a procedure whereby additional injection wells may be approved administratively.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 14, 1970

EXAMINER HEARING

IN THE MATTER OF:

Application of Moran Oil Producing &
Drilling Corporation for a waterflood project, Lea County, New Mexico. Case No. 4440

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING



dearnley-meier

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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CASE 4425: (Readvertised)

Application of Southern Gulf Production Company for an unorthodox gas well location, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks as an exception to the gas well location requirements of the Commission Rules and Regulations, approval for the Southern Gulf Production Company Navajo Tocito Well No. 4 at an unorthodox gas well location 1963 feet from the South line and 977 feet from the West line of Section 10, Township 26 North, Range 18 West, undesignated Pennsylvanian gas pool, San Juan County, New Mexico.

CASE 4426: (Readvertised)

Application of Texaco Inc. for salt water disposal, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Devonian formation in the open-hole interval from 11,150 feet to 11,794 feet in its Peery Federal Well No. 4 located in Unit A of Section 29, Township 15 South, Range 30 East, Little Lucky Lake-Devonian Pool, Chaves County, New Mexico.

CASE 4441: Application of Texaco Inc. for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Seven Rivers formation in the open-hole interval from 3260 feet to 3415 feet in its C. E. Penny Federal (NCT-4) Well No. 2 located in Unit F of Section 19, Township 25 South, Range 38 East, Langlie Mattix-Seven Rivers Pool, Lea County, New Mexico.

CASE 4442: Application of Texaco Inc. for an exception to Rule 505 of the Commission Rules and Regulations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 505 of the Commission Rules and Regulations to permit the assignment of more than one single top unit allowable for the Vacuum-Abo Reef Pool to two wells, the surface locations of which are in Unit E of Section 12, Township 18 South, Range 34 East, Lea County, New Mexico, as follows:

State "AE" Well No. 8 - 2310 feet from the North line and 330 feet from the West line;

State "AE" Well No. 10 - 1980 feet from the North line and 990 feet from the West line;

Said Well No. 10 is a relatively straight hole with all perforations confined entirely to said Unit 8, while said Well No. 8 is a crooked hole and would have perforations both in said Unit E of Section 12 and in Unit H of Section 11 of said Township and Range.

(Case 4437 continued)

(b) Create a new pool in Rossevelt County, New Mexico, classified as a gas pool for Pennsylvanian production and designated as the East New Hope-Pennsylvanian Gas Pool. The discovery well is the H. L. Brown, Jr., Mary Martin No. 1 located in Unit P of Section 29, Township 6 South, Range 34 East, NMPM. Said pool would comprise:

TOWNSHIP 6 SOUTH, RANGE 34 EAST, NMPM
SECTION 29: S/2

(c) Abolish the Warren-Abo Pool in Lea County, New Mexico, described as:

TOWNSHIP 20 SOUTH, RANGE 38 EAST, NMPM
SECTION 25: S/2
SECTION 26: SE/4
SECTION 35: NE/4
SECTION 36: N/2

TOWNSHIP 20 SOUTH, RANGE 39 EAST, NMPM
SECTION 30: S/2

(d) Extend the Dk-Abo Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 38 EAST, NMPM
SECTION 25: S/2
SECTION 26: SE/4
SECTION 35: NE/4
SECTION 36: N/2

TOWNSHIP 20 SOUTH, RANGE 39 EAST, NMPM
SECTION 30: S/2

(e) Extend the North Baum-Upper Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 13 SOUTH, RANGE 32 EAST, NMPM
SECTION 25: SE/4

(f) Extend the Lea-Bone Springs Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 34 EAST, NMPM
SECTION 36: SW/4

MR. NUTTER: Call Case No. 4440.

MR. HATCH: Application of Moran Oil Producing & Drilling Corporation for a waterflood project, Lea County, New Mexico.

MR. JENNINGS: I am James T. Jennings appearing on behalf of Moran Oil Drilling and Producing Corporation and I will have one witness, Mr. Ralph Gray.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 1 through 5 were marked for identification.)

RALPH GRAY,

having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. JENNINGS:

Q Would you state your name and occupation, please?

A Ralph L. Gray; my occupation is petroleum engineer.

Q Mr. Gray, have you appeared before and testified as a petroleum engineer and as an expert before this Commission on many occasions?

A Yes, sir.

MR. JENNINGS: Does the Commission accept Mr. Gray's qualifications?



MR. NUTTER: Yes, sir.

Q (By Mr. Jennings) Mr. Gray, are you familiar with the application that has been filed on behalf of Moran Oil Producing and Drilling Corporation in this action?

A Yes, I am.

Q Have you made a study of the area and of the matter sought in the application which is for a water injection well in the Grayburg Formation in the Hobbs Pool?

A Yes, sir.

Q Referring to what has been marked as Exhibit 1, would you refer to that and identify it, please, Mr. Gray?

A Exhibit No. 1 is a map of the Hobbs pool. The Applicant's acreage is shown with the yellow coloring in the northern portion of the pool. The red arrow refers to the Rice No. 4 well which the Applicant proposed to convert to a water injection well and will inject water into the Grayburg Formation.

Q How many wells does the Applicant have in that area, Mr. Gray?

A The Applicant has four wells on the Rice Lease and four wells on the Hardin Lease and one well in Section 17, which I am not certain what the designation is. This is located approximately a half mile east of the Hardin

Lease.

Q The Applicant is going to convert the Rice No. 4 Well?

A Yes, sir.

Q That's in the northwest northeast of Section 13?

A Yes. That's in the northwest of the northeast of Section 13, Township 18 South, Range 38 East.

Q What depth is the Applicant proposing to inject that water?

A The pay interval extends from -- oh, below a depth of four thousand feet and the bottom of the hole is short of forty-two hundred. This is seen in Exhibit 3 which is a log of this well and the open hole section extends from the depth of 4040 feet to -- well, a little below 4200 feet.

Q How much water do you propose to inject, Mr. Gray?

A This, of course, is a guess but it's anticipated that they will probably inject approximately 300 barrels per day, possibly at a pressure of 1500 pounds.

Q Where do you propose to obtain that water?

A It's proposed to drill a shallow water well to the Ogallala Formation. The Applicant has water rights and water appropriation in the Ogallala Formation. This well will be drilled on the lease.

Q Referring to what has been identified as Exhibit No. 4, would you identify that and explain what it is?

A Exhibit No. 4 is a diagrammatic sketch showing the location of the eight and five-eighths casing string. This string was cemented to the surface. Five and a half inch production string shown set at 4040 feet and has sufficient cement to adequately protect the formations.

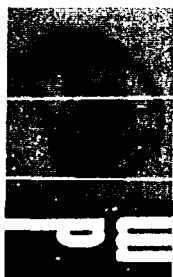
The five and a half is set below the top of the Grayburg. It's anticipated that a string of two-inch tubing will be run with a packer which will be set in the lower part of the five and a half inch casing and injection will be made below the packer into the open hole section.

Q Now, referring to Exhibit -- I believe it's Exhibit 3 -- that is a log of the injection well, is it not, Mr. Gray?

A That is correct.

Q Mr. Gray, referring now to Exhibit 4, would you tell the Commission just what that exhibit reflects -- Exhibit 5, excuse me.

A Exhibit 5 shows a tabulation of monthly oil production for the months of 1970 through July for the four wells



on the Rice Lease and the four wells on the Hardin B. Lease. This also shows the cumulative oil production for each of the individual wells. The purpose of this table is to show that the wells have essentially reached a stripper stage and so it is a good time to think about water injection.

Q What about this No. 4 well that you are going to convert; what type of well is it?

A This well makes less than one barrel of oil per day. None of the wells make any water to speak of.

Q What is the purpose of your injection, overall purpose?

A The Applicant wants to develop information in regard to the injectivity into the Grayburg Formation. Several engineering meetings have been held in the past in which consideration has been given to possibly forming a waterflood unit in the area, but no definite agreements were reached and in the meantime, the oil production continues to decline so that the Applicant feels that the wells have now reached a point where operators in the area will be more interested in a waterflood project and it's felt that if water can be injected into the No. 4 Rice Well, which is a rather poor well compared to the other wells on the lease, that then it can be

expected that injection can be done satisfactorily in any well in the area.

Q From your study, do you feel that the injection of water in this area is feasible?

A Yes, sir.

Q And will result in the ultimate increased production of oil?

A Yes, sir.

Q When do you propose to start injecting water, Mr. Gray?

A I'm not certain that the Applicant has any definite date in mind, but this is a thing that's going to be discussed with the operators and it's hoped that interest can be resumed and that some type of unit or at least some type of cooperative agreement might be reached within an early time.

I don't think that there is any definite specific date that the operator has in mind for doing this work.

Q Do you contemplate drilling this water well and start injecting in the not too distant future?

A Yes, sir.

Q Mr. Gray, were Exhibits No. 1 through 5 prepared by you or under your supervision?

A Yes. Did we touch on Exhibit 2?

Q Yes, I think you referred to that at the outset. If you desire, you might refer to Exhibit 2 and just state what it reflects.

A Exhibit 2 is a west-east cross section through this area and this section goes through the Rice No. 4 Well. This shows the structural characteristic in the area and indicates the top of the Grayburg Formation and the top of the lower Grayburg which is close to the top of the Grayburg pay.

The top of the San Andres can be seen in the well on the extreme left portion of this cross section being the Continental North Hobbs Unit No. 1. This well was drilled deeper than other wells in the area. This cross section just shows that injection will be into the Grayburg pay which can be correlated clear across the structure.

Q Was this exhibit and the other four exhibits Nos. 1, 3, 4 and 5 prepared by you or under your supervision?

A Yes, sir.

MR. JENNINGS: We would offer Exhibits 1 through 5 at this time and we have nothing further.

MR. NUTTER: Moran's Exhibits 1 through 5 will be admitted in evidence.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Gray, the Hobbs Pool, in certainly a portion of it, is considered to be a water drive pool, is this not true?

A Yes, that's true. The large part of the Hobbs Pool is producing from the San Andres Formation and most of the San Andres does have an active water drive present.

In the extreme northern portion of the pool, however, there is oil production occurring in the Grayburg Formation and it appears that there's no active water drive present in this formation since the wells have essentially depleted and there's no evidence of water.

Q So you figure from the Grayburg up here in the north end you will probably be producing from a solution gas drive reservoir?

A Yes, sir.

Q No water drive that you would have in the main body of the pool?

A Yes, that's true.

Q Well, now, I noticed on your cross section a portion -- and you called it to our attention -- a portion of the Grayburg is shown in only one well. How far is it to

dearnley-meier reporting services, inc.

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the San Andres wells where they are producing salt water along with their oil production, from these two leases, the Rice and the Hardin Lease?

A Well, for example, in Section 18 wells in the lower row, for example, in that section produce from the San Andres Formation.

Q Do they make considerable volumes of water?

A I really can't say. I don't have that particular information on those particular wells.

Q What I was wondering if there would be a reliable supply of salt water available somewhere in the neighborhood for operating this flood rather than using the fresh water, if it were possible?

A Well, at this stage the Applicant wishes to use fresh water. There's other things involved. The Applicant does have this water appropriation but, of course, we have to earn it but aside from that, it would be a rather complicated matter and would delay things to have to use water produced by some other operator.

Q And this operator doesn't produce any water?

A That's correct.

Q Is there production from any other horizon on either of these two leases?

A No. All the production from the Moran Leases is coming from the Grayburg Formation.

Q I see. Now, the eight and five-eighths casing which is cemented at 299 feet is this pipe set at a sufficient depth to protect the Ogalalla water formation?

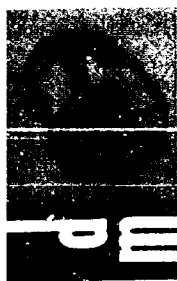
A In the case of the Rice No. 4 the eight and five-eighths inch casing is set at 299 feet and it's my understanding that the Ogalalla Formation is shallower.

Q So this would be adequate then to protect the Ogalalla?

A Yes, sir.

Let's expand our discussion a little bit more in regard to the possibility of using a produced water. A water-flood operation has to be conducted continuously with a continuous supply of water available because it takes that type of operation in order to insure a proper flood.

Now, if an attempt was made, for example, to use produced water from some producing leases in the area, for example, then you are solely dependent upon this operator continuing to produce water and having it available at all times and this definitely can't be depended upon because very often operators are attempting to shut off water by various chemical means and so forth and so it just isn't practical to try to use a source of



produced water from some other operator in the area.

Q Yes, sir.

MR. NUTTER: Are there any further questions of Mr. Gray?

CROSS EXAMINATION

BY MR. RAMEY:

Q Then again, Mr. Gray, expounding a little further on this produced water if you did, say, go to Rice Engineering, that would probably be a reliable source, they would probably have water available if you --

A The water that's collected by Rice Engineering is a complicated mixture of all types of waters that is continually changing and it's not at all what I would consider a suitable water that you would want to use for injection because there are too many problems connected with the treating of this water and it's very necessary in a waterflood project that you inject a water that will not form scales and plug the formation and various other things that can happen to you. So, by trying to use the water of this nature, you might very well condemn a project that if you were using suitable water you might be successful in, so you don't consider that that type of water would be at all useable

for this type of a project.

Q But, you don't know this, do you?

A Yes, sir, I know it by experience.

Q I mean, have you ran any compatibility tests between, say, Rice's water and the water that's in the formation in the Grayburg?

A It's my experience and I do operate quite a few waterflood projects and have for a number of years and it's my experience that this type of water is not suitable for a waterflood project.

Q Well, this water is primarily San Andres water though, is it not?

A Well, waters that are being collected by any disposal company, like I previously stated, they are always changing because somebody else drills a well some place and you might add water from some other formation next week.

Q Well, the disposal system for the Hobbs Pool is for the Hobbs Pool water, is it not? I think there might be some --

A Yes, but these people are in the business of gathering water for disposal purposes and if someone drills a deep well out here close, well, of course, they are

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anxious to handle their water and dispose of it and it would have to be disposed of so next week you might very well have San Andres water mixed with Devonian water or some other formation. It just isn't a workable plan.

Q Well, probably if they mixed any water the two waters would be compatible so that they wouldn't be plugging their disposal well, wouldn't they?

A I wouldn't think that they would be compatible based on my experience.

MR. NUTTER: Well, Mr. Gray, water can be treated to make it compatible with formation water, but I think what you are saying is that from day to day operations of a salt water gathering system that's taking in wells from all formations, your water quality may change so you would have to be constantly adjusting your treating facilities.

THE WITNESS: Yes, you would have to be constantly changing your treating system, but let's not oversimplify this treating thing.

MR. NUTTER: Well, I wasn't trying to oversimplify it, I am saying water can be treated but you would have to always be adjusting and changing your treatments to take in other wells.

THE WITNESS: Water can always be treated but not always successfully. In other words, we can make an attempt to treat and we can treat it to a certain extent. I can show you operations that the water injection lines have just been clogged up almost completely shut with scale material and along with this there's been an attempt to treat this water, but what I am saying is that you can't be one hundred percent successful in treating water.

It's a very complicated, costly procedure and it just doesn't lend itself to approving a flood. You wouldn't want to condemn this thing because of an inadequate water and these waters -- these produced waters are highly complicated and can cause a lot of these scale problems regardless of the treating procedures.

MR. NUTTER: Are there further questions of Mr. Gray?

MR. JENNINGS: One other question.

REDIRECT EXAMINATION

BY MR. JENNINGS:

Q The purpose of injecting this fresh water at this time is to determine the feasibility of the flood, is it not, Mr. Gray?

A Yes. That's not to say that at some time produced

water may not be used --

Q If and when --

A -- but certainly in this stage of the thing it's felt that fresh water is desirable to approve the flood.

Q Where is the fresh water well to be located? I don't recall that we located the well. Is it to be located in the northeast quarter northwest quarter of Section 13?

A Yes, sir. That's correct.

MR. JENNINGS: I believe that's all.

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

(Witness excused.)

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

MR. JENNINGS: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in Case No. 4440?

We will take the case under advisement.

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I N D E X

WITNESS

RALPH GRAY

PAGE

Direct Examination by Mr. Jennings

2

Cross Examination by Mr. Nutter

9

Cross Examination by Mr. Ramey

12

Redirect Examination by Mr. Jennings

15

E X H I B I T S

Applicant's 1 through 5

2

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

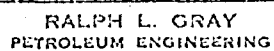
Glenda Burks
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the hearing of Case No. 4440 heard by me on 10/14 1970

[Signature]

New Mexico Oil Conservation Commission

MORAN - RICH #4



Cement circulated

8-5/8" casing at 299' with 175
sacks cement.

Top of cement 2460' (est.)

5½" casing at 4040' with 250 sacks cement.

Total Depth - 4226'.

1. Working out
 about 300 to 500
 to about 1000 per
 who were coming from
 Shawanash with us
 (C. H. H. a former)

Exhibit #4

RALPE L. GRAY - PETROLEUM ENGINEERING

PROJECT: _____

POOL: _____ HORRS

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION

App. EX. 2011 NO. 5

CALL NO. 4440

WELL PRODUCTION DATA

MORAN OIL PRODUCING & DRILLING CO.

LEASE ROBERT M. MORAN

| YEAR & MONTH | MORAN OIL PRODUCING & DRILLING CO. | | | | | LEASE ROBERT M. MORAN | | | | | LEASE TOTAL | | | | |
|--------------|------------------------------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | WELL #1 | WELL #2 | WELL #3 | WELL #4 | TOTAL | WELL #1 | WELL #2 | WELL #3 | WELL #4 | TOTAL | WELL #1 | WELL #2 | WELL #3 | WELL #4 | TOTAL |
| | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER | OIL · WATER |
| 1970 - Jan. | 84 | 336 | 218 | 34 | 672 | 77 | 170 | 109 | 140 | 496 | | | | | |
| Feb. | 85 | 338 | 219 | 34 | 676 | 76 | 166 | 104 | 131 | 471 | | | | | |
| Mar. | 82 | 330 | 214 | 33 | 659 | 76 | 168 | 107 | 137 | 488 | | | | | |
| Apr. | 64 | 255 | 167 | 24 | 510 | 80 | 168 | 109 | 138 | 495 | | | | | |
| May | 58 | 233 | 151 | 24 | 466 | 64 | 156 | 95 | 124 | 439 | | | | | |
| June | 55 | 218 | 141 | 22 | 436 | 34 | 123 | 64 | 93 | 314 | | | | | |
| July | 49 | 197 | 127 | 20 | 393 | 77 | 169 | 108 | 138 | 492 | | | | | |
| | 477 | 1,907 | 1,237 | 191 | 3,812 | 484 | 1,114 | 696 | 901 | 3,195 | | | | | |
| Cumulative | 60,095 | 86,229 | 74,488 | 14,204 | 235,016 | 51,811 | 48,352 | 47,340 | 42,561 | 190,064 | | | | | |

Exhibit #5

JAMES T. JENNINGS
SIM B. CHRISTY IV
ROGER L. COPPLE
BRIAN W. COPPLE

LAW OFFICES OF
JENNINGS, CHRISTY & COPPLE
1012 SECURITY NATIONAL BANK BUILDING
P. O. BOX 1180
ROSWELL, NEW MEXICO 88201

TELEPHONE 622-8432
AREA CODE 505

September 24, 1970

Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

JMJ
Case 4440

RE: MORAN OIL PRODUCING & DRILLING CORPORATION APPLICATION

Enclosed herewith you will find the Application of Moran Oil Producing & Drilling Corporation for a waterflood project and authority to inject water into one of its wells in the Hobbs Pool. It is my understanding that this will be placed upon the examiner's docket for October 14, 1970.


JAMES T. JENNINGS

JTJ/mb
Encl.

cc: Moran Oil Producing & Drilling Corp.

DOCKET MAILED

Date 10-2-70

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF
MORAN OIL PRODUCING & DRILLING
CORPORATION TO INSTITUTE A WATERFLOOD
PROJECT AND TO INJECT WATER INTO THE
GRAYBURG FORMATION THROUGH ITS RICE
NO. 4 WELL LOCATED IN THE NW $\frac{1}{4}$ NE $\frac{1}{4}$
SECTION 13, TOWNSHIP 18 SOUTH, RANGE
37 EAST, N.M.P.M., LEA COUNTY, NEW
MEXICO, IN THE HOBBS POOL.

Case 4440

APPLICATION

Comes now the applicant, Moran Oil Producing & Drilling Corporation, and hereby makes application for a waterflood project and for authority to inject water into the Grayburg formation in the Hobbs Pool pursuant to Rule 701 of the Rules and Regulations of the Commission and states:

1. Applicant is the owner and operator of the leases covering the NE $\frac{1}{4}$ Section 13, Township 18 South, Range 37 East, and the S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 17, NW $\frac{1}{4}$ Section 18, Township 18 South, Range 38 East, in the Hobbs Pool, and has nine wells located thereon which are approaching an advanced state of depletion.

2. The applicant desires to convert its Rice No. 4 Well located in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 13 to a water injection well to determine the feasibility of instituting a waterflood project, and, if feasible, to institute such a waterflood project.

3. Applicant proposes to inject fresh water into the Grayburg formation into an open hole below the depth of 3930 feet and to inject approximately 300 barrels per well per day, which water is to be produced from the Ogallala formation from a well

which the applicant proposes to drill in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 13, Township 18 South, Range 37 East. If and when produced water becomes available, it will be commingled with fresh water.

4. In support of this application and in accordance with the provisions of Rule 701, applicant submits herewith the following exhibits:

(a) Exhibit A - A plat showing the location of the proposed injection well, location of the other wells and their ownership of all other leases within a two mile radius which are producing from the same formation and also showing the applicant's acreage within the area.

(b) Exhibit B - A diagramatic sketch of the injection well showing the tops of the cement, casing and depths.

(c) Exhibit C - The log of applicant's Rice No. 4 well located in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 13, Township 18 South, Range 37 East.

WHEREFORE, applicant requests the Commission set this matter down for hearing before an examiner at an early date, publish the Notice as required by law, and after hearing issue its Order (1) authorizing the waterflood project and injection of water into the Grayburg formation in applicant's Rice No. 4 Well located in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 13, Township 18 South, Range 37 East; and (2) establishing rules for the operation of the project within the area and for administrative expansion and conversion of additional wells to water injection wells.

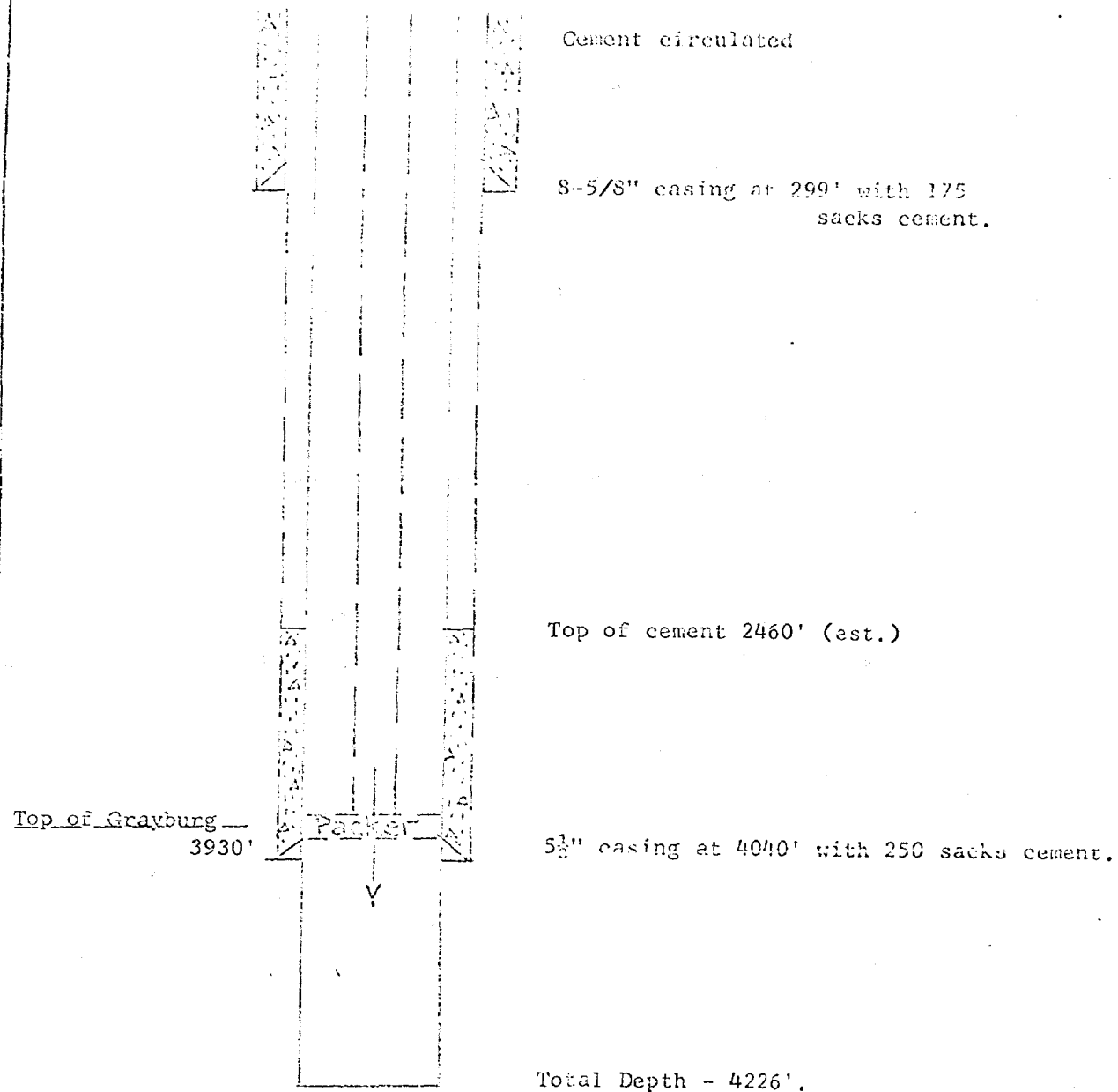
Respectfully submitted,

MORAN OIL PRODUCING & DRILLING
CORPORATION

By _____
James T. Jennings, for
Jennings, Christy & Copple
Attorneys for Applicant
P. O. Box 1180
Roswell, New Mexico 88201

EXHIBIT B

EXHIBITION WELL DIAGRAM



RALPH L. GRAY
PETROLEUM ENGINEERING

Case 44-10

GMH/esr

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

Order No. R- 4050

ORDER OF THE COMMISSION

9:30

NOW, on this _____ day of October, 1970, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

seeks authority to institute a/waterflood project in the _____

by the injection of water into the Grayburg formation
 through its Rice Well No. 4 the NW/4 NE/4 of
~~one~~ injection wells in/Section 13

Township 18 ~~Nor~~ South, Range 37 ~~West~~ East,
NMPM, Lea County, New Mexico.

(SEE UNDER)

waste.

(6) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations; provided however, that the showing of well response as required by Rule 701 E-5 should not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

IT IS THEREFORE ORDERED:

(1) That the applicant, Moran Oil Producing & Drilling Corporation,
pilot
is hereby authorized to institute a waterflood project in the

~~=====Unit Area=====~~ Hobbs Pool *on its*
"Rice" lease in the NE 1/4 of Section 13, Township 18 South, Range 37 East, NM PM, Lea County, New Mex
by the injection of water into the Grayburg formation

~~through the following described wells in Township=====~~

~~North=====South=====Range=====West=====East=====NM PM=====~~

~~County=====New Mexico=====~~

its Rice Well No. 11.
through ~~one~~ injection well located in the NW/4 NE/4 of ~~Section 13~~ *said* ~~and the project~~
is hereby designated the "Moran Hobbs Rice" waterflood project.
~~Township 18 South, Range 37 East, NM PM, Lea County, New Mexico.~~

(2) That the Secretary-Director of the Commission *may approve*
the institution of an additional waterflood project on the
applicant's "B" lease in the NW/4 of Section 18, Township 18 South,
Range 38 East, NM PM Lea County, New Mexico, upon the completion of
a water injection well for said pool on said lease.

above-described
(3) That the subject waterflood project is hereby designated
the Waterflood Project and shall

be governed by the provisions of Rules 701, 702, and 703 of the
Commission Rules and Regulations;

above-described
PROVIDED HOWEVER, that the Secretary-Director of the Commis-
sion may approve expansion of the ~~waterflood project~~
waterflood projects to include such additional ~~lands and~~ injection wells
in the area of said projects as may be necessary to complete an
efficient water injection pattern; that the showing of well
response as required by Rule 701 E-5 shall not be necessary before
obtaining administrative approval for the conversion of additional
wells to water injection.

(SEE UNDER)
entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove
designated.

CASE 4441: Application of TEXACO
INC. FOR SALT WATER DISPOSAL,
LEA COUNTY, NEW MEXICO.