

CONFIDENTIAL: Application of C. T.  
to an agent working  
on a special project.

Case No.

1974

Application, Transcript,  
Small Exhibits, Etc.

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. 1974  
Order No. R-1688

APPLICATION OF C. T. ROBERTSON  
FOR AN ORDER AUTHORIZING A  
WATERFLOOD PROJECT IN THE  
COYOTE-QUEEN POOL, CHAVES  
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 1, 1960, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 7th day of June, 1960, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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, C. T. Robertson, proposes to institute a waterflood project in the Coyote-Queen Pool by the injection of water into the Queen formation through the following-described wells in Township 11 South, Range 27 East, NEPM, Chaves County, New Mexico:

Robertson Honolulu State Well No. 1,  
NW/4 NW/4 of Section 14

Robertson Honolulu State Well No. 2,  
NE/4 NW/4 of Section 14

Robertson Honolulu State Well No. 3,  
SW/4 NW/4 of Section 14

Robertson Honolulu State Well No. 4,  
SE/4 NW/4 of Section 14

Robertson Honolulu State "B" Well No. 1,  
NE/4 SE/4 of Section 11

Robertson Honolulu State "B" Well No. 3,  
NW/4 SE/4 of Section 11.

(3) That the producing wells in the area to be waterflooded are substantially depleted.

(4) That the proposed waterflood project should be authorized and should be governed by the provisions of Rule 701 of the Commission Rules and Regulations, including those provisions regarding allocation of allowables and expansion of the project area.

IT IS THEREFORE ORDERED:

(1) That the applicant be and the same is hereby authorized to institute a waterflood project in the Coyote-Queen Pool by the injection of water into the Queen formation through the following-described wells in Township 11 South, Range 27 East, NDPM, Chaves County, New Mexico:

Robertson Honolulu State Well No. 1,  
NW/4 NW/4 of Section 14

Robertson Honolulu State Well No. 2,  
NE/4 NW/4 of Section 14

Robertson Honolulu State Well No. 3,  
SW/4 NW/4 of Section 14

Robertson Honolulu State Well No. 4,  
SE/4 NW/4 of Section 14

Robertson Honolulu State "B" Well No. 1,  
NE/4 SE/4 of Section 11

Robertson Honolulu State "B" Well No. 3,  
NW/4 SE/4 of Section 11

PROVIDED HOWEVER, That if the applicant uses fresh water in the said waterflood project, then injection through the casing is permissible. If, however, the applicant chooses to use Devonian salt water, then the injection of such water shall be through tubing with a packer set immediately above the injection zone.

(2) That the operation of the waterflood project herein authorized shall be governed by the provisions of Rule 701 of the Commission Rules and Regulations, including those provisions regarding allocation of allowables and expansion of the project area.

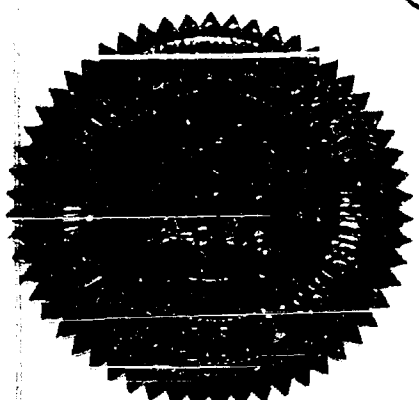
-3-

CASE No. 1974  
Order No. R-1688

(3) That monthly progress reports on the waterflood project herein authorized shall be submitted to the Commission in accordance with Rule 704 and Rule 1119 of the Commission Rules and Regulations.

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

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION



*John Burroughs*  
JOHN BURROUGHS, Chairman

*Murray E. Morgan*  
MURRAY E. MORGAN, Member

*A. L. Porter, Jr.*  
A. L. PORTER, JR., Member & Secretary

EST/

|                             |      |
|-----------------------------|------|
| BEFORE EXAMINER UTZ         |      |
| OIL CONSERVATION COMMISSION |      |
| WATER NO.                   | 5    |
| CASE NO.                    | 1974 |

# WATER ANALYSIS

Whaley Co.  
Sec. 10, T. 11 S.,  
R. 27 E.

Chisum Pool  
Sec. 13, T. 11 S.,  
R. 27 E.

Formation  
Depth

Yates  
150'

Devonian  
6700'

## Chemical Analysis - PPM

|                                       |      |       |
|---------------------------------------|------|-------|
| pH                                    | 7.4  | 7.0   |
| Total Alkalinity as CaCO <sub>3</sub> | 104  | 770   |
| Supersaturation as CaCO <sub>3</sub>  | 2    | 30    |
| Calcium                               | 1540 | 1550  |
| Magnesium                             | 360  | 332   |
| Barium                                | None | None  |
| Sodium                                | 51   | 13800 |
| Chloride                              | 57   | 24250 |
| Sulphate                              | 1755 | 375   |
| Iron                                  | 0.6  | 0.4   |
| Total dissolved solids                | 2690 | 41100 |
| Carbon Dioxide                        | 8.3  | 200   |
| Hydrogen Sulphide                     | None | 1.5   |

GOVERNOR  
JOHN BURROUGHS  
CHAIRMAN

State of New Mexico  
Oil Conservation Commission

LAND COMMISSIONER  
MURRAY E. MORGAN  
MEMBER



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

P. O. BOX 871  
SANTA FE

Harvey, Dow & Hinkle  
Box 247  
Roswell, New Mexico

June 7, 1960

Attention: Mr. Clarence Hinkle

Gentlemen:

Enclosed herewith is Commission Order No. R-~~1688~~<sup>1689</sup>, entered in Case No. 1974, approving the Robertson-Coyote-Casen Water Flood Project.

According to our calculations, 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 280 barrels per day.

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

OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

Date 6-2-60

CASE 1974 Hearing Date 6-1-60

My recommendations for an order in the above numbered cases are as follows:

1. Grant C. T. Robertson's request for a water flood in the Coyote Queen Pool.

2. Approve injection wells as follows:

|                           |       |                |
|---------------------------|-------|----------------|
| Robertson Honolulu Lt. #1 | NW NW | 14 - 11S - 27E |
| " " #2                    | NE NW | " " "          |
| " " #3                    | SW NW | " " "          |
| " " #4                    | SE NW | " " "          |
| " " "B" #1                | NE SE | " " "          |
| " " " " #3                | NW SE | " " "          |

3. <sup>water</sup> Fresh water may be injected thru the casing. If Devonian salt water is used it shall be injected thru the tubing with a packer set above the injection zone.

3. Admin approval for additional injection wells.

4. Grant H<sub>2</sub>O flood order otherwise

*Thos A. Velt*

Staff Member



- CASE 1974: Application of C. T. Robertson for an order authorizing a water flood project. Applicant, in the above-styled cause, seeks an order authorizing him to institute a water flood project in the Coyote-Queen Pool, Chaves County, New Mexico, by the injection of water into the Queen formation through six wells located in Sections 11 and 14, Township 11 South, Range 27 East.
- CASE 1975: Application of Amerada Petroleum Corporation for approval of, an oil-oil dual completion. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its State LM "T" Well No. 5, located in Unit A, Section 36, Township 23 South, Range 36 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Jalmat Gas Pool and the production of oil from the Langlie-Mattix Pool through parallel strings of 1-inch tubing and 2-3/8 inch tubing respectively, utilizing a retrievable type packer to separate the two producing horizons.
- CASE 1976: Application of Caulkins Oil Company for approval of a gas-gas dual completion and for the establishment of a non-standard gas unit. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its Reuter PC-297 well in such a manner as to permit the production of gas from the South Blanco-Pictured Cliffs Gas Pool and the production of gas from the Dakota Producing Interval through parallel of 1 1/4-inch and 2 3/8 inch tubing respectively. Applicant further seeks an order establishing a non-standard gas unit to be dedicated to the subject well in the Dakota Producing Interval consisting of the SW/4 of Section 15 and the NW/4 of Section 22, Township 26 North, Range 6 West, Rio Arriba County, New Mexico.
- CASE 1977: Application of Hondo Oil & Gas Company for approval of an automatic custody transfer system. Applicant, in the above-styled cause, seeks an order authorizing the installation of an automatic custody transfer system to handle the production from the Empire-Abo Pool from all wells presently completed or hereafter drilled on the Hondo-Western-Yates State 647 lease, which lease consists of acreage in Sections 25, 26, 34, 35, and 36, all in Township 17 South, Range 28 East, Eddy County, New Mexico.

Docket No. 15-60

CASE 1978:

Application of Shell Oil Company for an order authorizing two salt water disposal wells. Applicant, in the above-styled cause, seeks an order authorizing the disposal of produced salt water through its State ETA Well No. 1, located in the NE/4 NE/4 of Section 8, Township 16 South, Range 35 East, Lea County, New Mexico, with the injection to be in the Wolfcamp formation in the interval from 10,365 feet to 10,463 feet. Applicant further seeks an order authorizing the disposal of produced salt water through its State EDA Well No. 2, located in the SW/4 SW/4 of Section 7, Township 16 South, Range 35 East, Lea County, New Mexico, with injection to be in the Wolfcamp formation in the interval from 10,712 feet to 10,734 feet.

CASE 1979:

Application of The Atlantic Refining Company for an order authorizing a water injection project in the Horseshoe-Gallup Oil Pool, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the injection of water, for purposes of pressure maintenance and/or secondary recovery, into the Horseshoe-Gallup Oil Pool through 15 wells located in Sections 19, 20, 29, 30 and 31, Township 31 North, Range 16 West, San Juan County, New Mexico. Applicant further requests that special rules and regulations be promulgated governing the operation of this water injection project including the assignment of a project allowable.

CASE 1980:

Application of Hudson and Hudson for nine unorthodox locations. Applicant, in the above-styled cause, seeks an order authorizing the drilling of wells at nine 5-spot locations on its Puckett "A" Lease, Maljamar Pool, Lea and Eddy Counties, New Mexico, said wells to be located in the 40-acre units hereinafter described, and within 100 feet of the indicated corner thereof.

SW Corner Unit O, Section 13, and the following wells in Section 24:

|                   |                   |
|-------------------|-------------------|
| SE Corner Unit D; | SE Corner Unit F; |
| NW Corner Unit C; | NE Corner Unit G; |
| SW Corner Unit B; | NW Corner Unit K; |
| NW Corner Unit A; | NW Corner Unit I; |

all in Township 17 South, Range 31 East, Eddy County.

-5-

Docket No. 15-60

CASE 1986:

Application of J. M. Welch for a gas-oil dual completion. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of his Etz Well No. 3, located in the NE/4 SE/4 of Section 13, Township 16 South, Range 30 East, Eddy County, New Mexico, in such a manner as to produce gas from the Penrose sand of the Queen formation and to produce oil from the Lovington sand of the San Andres formation in the Henshaw (San Andres) Pool, through the casing-tubing annulus and 2-inch tubing respectively, utilizing a retrievable type packer to separate the two producing horizons.

Cal 1974

J. M. HERVEY 1874-1953

HIRAM H. DOW  
CLARENCE E. HINKLE  
W. E. BONDURANT, JR.  
GEORGE H. HUNKER, JR.  
HOWARD C. BRATTON  
S. B. CHRISTY, V.  
LEWIS C. COX, JR.

PAUL W. EATON, JR.  
ROBERT C. BLEDSOE

LAW OFFICES  
HERVEY, DOW & HINKLE  
HINKLE BUILDING  
ROSWELL, NEW MEXICO

TELEPHONE MAIN 2-6510  
Post Office Box 547

May 11, 1960

Re: In the Matter of the Application  
of C. T. Robertson for Authority  
to Institute a Waterflood Project  
in the Coyote Queen Pool, Chaves  
County, New Mexico, and for  
Expansion Thereof by Administra-  
tive Procedure

TO: Oil Conservation Commission  
State of New Mexico  
Santa Fe, New Mexico

Comes now the Applicant, C. T. Robertson, and requests authority to institute a waterflood project in the Coyote Queen Pool in Chaves County, New Mexico, and for expansion thereof by administrative procedure and in support thereof shows:

1. There is attached hereto a plat showing the location of the proposed injection wells, circled in red, and the location of all other wells within a radius of two miles of said proposed injection wells, and the formation from which said wells are producing. Said plat also indicates the lessees within said two-mile radius.

2. All available logs of the proposed injection wells are filed herewith. Said logs are of the Honolulu State "B" No. 3, Honolulu State No. 1, Honolulu State No. 4, and Honolulu State No. 3. It is anticipated that additional logs may be available prior to hearing on this application, and the same will be submitted as soon as available.

3. The casing program of the proposed injection wells is with 4½ inch casing set through the Queen formation and perforated, with the casing cemented to the surface. The proposed method for testing casing before use as injection wells will be in conformity with the established rules of the Commission.

4. The zone into which injection will be made is the Queen Sand formation which in the wells into which injection will be made is perforated from 947 through 1053 feet in various wells.

5. Water will be injected at an approximate rate of 90 barrels per day per injection well. The source of the injection fluid is fresh water from the Yates formation at an approximate depth of 150 feet in Section 10, T. 11 S., R. 27 E., N.M.P.M. However, if the fresh water injection program does not work satisfactorily, it would be anticipated that salt water from the Devonian formation at approximately 6700 feet in Section 13, T. 11 S., R. 27 E., N.M.P.M. would be utilized.

6. Applicant requests that an allowable be assigned to the waterflood project in accordance with applicable rules and regulations. It is further requested that an order be entered authorizing expansion of the waterflood project sought herein by administrative procedure in accordance with applicable rules and regulations. The outline of the proposed total project is shown on the Exhibit attached hereto.

7. Applicant has made compliance with the Commission's Memorandum No. 5-58 dated January 31, 1958.

WHEREFORE, Applicant respectfully requests that this Application be set before an Examiner hearing and that upon such hearing, the Commission enter an Order authorizing Applicant to institute a waterflood project in the manner set forth hereinabove, and that authority be granted to expand such flood by administrative procedure in accordance with the rules of the Oil Conservation Commission, and for such other order as may be appropriate in the premises.

Respectfully submitted,

C. T. ROBERTSON

By 

Hervey, Dow & Hinkle  
Box 547  
Roswell, New Mexico

Attorneys for Applicant

COPY

HERVEY, DOW & HINKLE, ATTORNEYS  
ROSWELL, NEW MEXICO

*Copy 1974*

May 11, 1960

State Engineer of New Mexico  
Santa Fe  
New Mexico

Gentlemen:

In accordance with Memorandum No. 5-58 of the New Mexico Oil Conservation Commission, enclosed herewith please find Application of C. T. Robertson for permission to institute a waterflood project in the Coyote Queen Pool in Chaves County, New Mexico.

The Application shows the location of the water source, and the name and depth of the formation from which water is to be obtained.

Also, enclosed is a copy of an analysis of the water proposed to be utilized in the waterflood project. As shown in the Application, it is proposed to use fresh water, provided that if the flood does not respond to the fresh water, then it is anticipated that salt water might be utilized.

Attached to the copy of the Application transmitted herewith are copies of the logs of two wells, being the Honolulu State Nos. 3 and 4. In addition, there were submitted to the Commission logs of Honolulu State No. 1 and Honolulu State "B" No. 3 Wells. If duplicate copies of these logs are desired, please let me know and we will attempt to obtain duplicates for your use. If you could utilize the logs submitted to the Commission, we would not then otherwise obtain duplicates of these two logs. In addition, attempts are being made to obtain logs of the other wells into which it is proposed to inject. If logs can be obtained on the other two wells, we will furnish them to you.

If there are any questions pertaining to this Application, please let us hear from you.

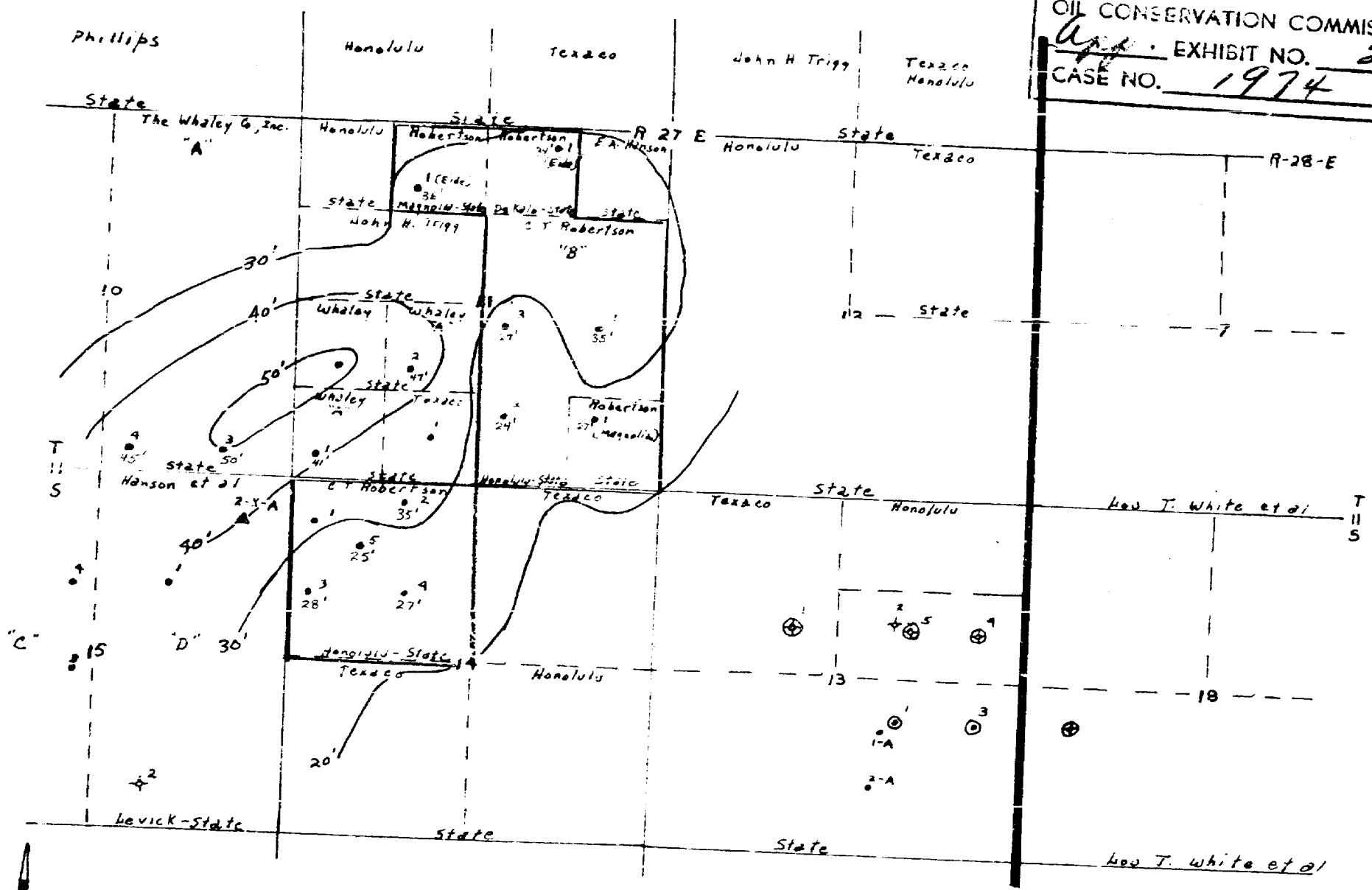
Very truly yours,

HERVEY, DOW & HINKLE

By *Harold P. Hinkle*

HCB:db  
Enclosures

BEFORE EXAMINER UTZ  
 OIL CONSERVATION COMMISSION  
 App. EXHIBIT NO. 2  
 CASE NO. 1974



COYOTE QUEEN POOL  
 Chaves County, New Mexico

Scale 1" = 2000'

- = Producing Well - Queen
- ⊙ = Conversion to Injection - Queen
- ⊕ = Proposed Injection Well - Queen
- = Proposed Producing Well - Queen

⊙ = Devonian Well Net Sand Map

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
June 1, 1960

EXAMINER HEARING

IN THE MATTER OF:

Application of C. T. Robertson for an order authorizing a water flood project. Applicant, in the above-styled cause, seeks an order authorizing him to institute a water flood project in the Coyote-Queen Pool, Chaves County, New Mexico, by the injection of water into the Queen formation through six wells located in Sections 11 and 14, Township 11 South, Range 27 East.

Case 1974

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 1974.

MR. PAYNE: Application of C. T. Robertson for an order authorizing a water flood project.

MR. HINKLE: Clarence Hinkle. I would like to enter an appearance in the case for Mr. C. T. Robertson, Hervey, Dow and Hinkle, Roswell. We have one witness, Mr. Bob Prentice, whom we would like to have sworn.

(Witness sworn.)

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

You may proceed.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO





BOB PRENTICE

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q Your name is Bob Prentice? A That is correct.

Q Where do you live? A Abilene, Texas.

Q What is your profession?

A I am an independent consulting petroleum engineer.

Q Are you a graduate petroleum engineer?

A Yes, sir, University of Pittsburgh.

Q Are you also a graduate geologist?

A That's right.

Q Where from?

A College of Wooster, Wooster, Ohio.

Q What year did you graduate?

A 1942.

Q What year did you graduate as petroleum engineer?

A 1947.

Q Have you practiced your profession since that time?

A That's right.

Q What companies have you been with?

A The Interstate Refining Corporation in Bradford, Pennsylvania, Stanolind Oil and Gas Company, Tulsa, Oklahoma, Russell

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



Engineering Consulting Firm in Abilene, Texas.

Q Have you made a study of any fields in New Mexico for water flood purposes?

A I have been involved in studies of the Brown Field, which is North of the Coyote-Queen Pool and in the High Lonesome Pool East of Artesia.

Q Have you been employed by Mr. Robertson to make a study of the Coyote-Queen area?

A That's right.

Q And his leases that are involved there?

A Yes, sir.

Q Are you familiar with the application that has been filed by Mr. Robertson in this case?

A I am.

Q What kind of a study have you made of Mr. Robertson's leases out in the Coyote-Queen area?

A Well, we have surveyed Mr. Robertson's leases to determine the pattern that could be used in a pilot flood for installation of this pilot flood to try to increase the recovery from this particular pool.

Q Did you prepare and file with the application a plat showing the leases involved?

A I did, sir.

Q I believe that was filed as Exhibit 1 or A. Do you have



that same exhibit before you?

A I do.

Q Has that been marked as Exhibit No. 1?

A Yes.

Q Will you refer to it and explain to the Commission what it is, what it shows?

A This Exhibit No. 1 is a map of the area in which Mr. C. T. Robertson owns some leases. These leases are outlined in

red, the offset leases and operators are indicated on this plat. The wells circled in red are the proposed pilot injection wells.

Q Does this show all the wells that have been drilled in the area and surrounding these leases?

A Yes, sir.

Q What is the description of your proposed project area?

A The proposed project area is that area enclosed by the red lines on this Exhibit 1.

Q By legal description, what would that be as far as the actual description is concerned? This is in Township 11 South, Range 27 East, is it not?

A That's right. The Honolulu State Lease would be in the Northwest Quarter of Section 14, the Honolulu State B Lease, and the Magnolia Honolulu State Lease would be in the East Half of Section 11, Range 27 East, Township 11 South.

Q Is that all of the East Half or does it omit the



Northeast of the Northeast Quarter, Section 11?

A That's right. The Northwest of the Northeast Quarter is the Eide de Kalb State Lease. The remaining 40 acre tract is the Magnolia State Lease which would be the Northeast of the Northeast of the West Half of Section 11, Range 27 East, Township 11 South.

MR. UTZ: Did you say Northeast Northeast?

A Of the West Half.

MR. UTZ: The Magnolia is the Northeast Northwest, isn't it?

Q You are speaking now of the Eide de Kalb?

A Right.

Q That would be the Northeast of the Northwest of Section 11?

A Yes.

Q All right now, Section 14, is that the Northwest Quarter of Section 14?

A Yes, sir.

Q Do you know whether or not Mr. Robertson owns the oil and gas leases covering this entire area that you have described?

A To the best of my knowledge, he does.

Q Is this State land or Federal land?

A State land.

Q It is all State land? A Yes, sir.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CM 3-6691

ALBUQUERQUE, NEW MEXICO

Q Do you know whether or not the royalty interests are uniform under the area?

A Yes, sir, as far as I know.

Q As far as the State is concerned, you know that?

A Yes, sir.

Q As far as any overriding royalties are concerned, do you know whether they're uniform if there are any?

A I think probably Mr. Robertson ought to testify to that.

MR. HINKLE: I don't think it's too material.

Q I believe you stated that Exhibit 1 shows the injection wells?

A The proposed injection wells, yes, sir.

Q There are six of those? A Right.

Q Two of them in Section 11 and four in Section 14?

A Right.

Q What is the character of the production in this area at the present time?

A All of these wells are now in the stripper stage of production and the average daily production per well is down between four and five barrels.

Q Have you prepared a plat or isopach plat which shows the sand thickness of the area?

A Yes, sir, I have.

MR. HINKLE: That has been identified as Mr. Robertson's



Exhibit No. 2.

(Whereupon Mr. Robertson's Exhibit No. 2 was marked for identification.)

Q Referring to Exhibit No. 2, will you explain to the Commission what this shows?

A This is an isopach or sand thickness map based on the net oil sand found underneath the leases shown in the area.

Q That's the Queen sand you are talking about?

A That's the Queen sand. Mr. Robertson's leases are shown again outlined in red.

Q What is the approximate depth of the Queen sand in the area?

A It will come in between 950 and 1,000 feet.

Q What is the approximate thickness of the sand underlying the Robertson leases?

A Thirty feet.

Q That's the average? A Yes, sir.

Q Is there anything else, any further comment you would like to make with respect to Exhibit No. 2?

A I don't believe so.

Q Have you filed with the application logs of the proposed injection wells?

A Yes, sir, however, at the time we filed those, filed our application, we were short two logs.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Which wells were they?

A We were short the Honolulu State No. 2 and the Honolulu State B No. 1.

Q You have logs of those wells at the present time?

A I have a gamma log of the State No. 2 well, and a core graph of the State --

Q Will you have the gamma log identified as Exhibit No. 3?

A Do you want the other one as No. 4?

Q What did you state that was?

A This is a core graph of the sand in the State B No. 1.

Q Is there a log of that well, to your knowledge?

A I don't believe there is a log or gamma log available.

Q This is the best evidence you have of the formation involved here?

A That's right.

MR. HINKLE: Have that identified as Exhibit 4.

(Marked Mr. Robertson's Exhibit No. 4, for identification.)

Q Do you have any further comments with respect to the proposed injection wells and logs of the wells?

A These injection wells will be completed by setting, or have been completed by setting 4½" casing through the pay zone, perforating opposite the pay section. The wells were cemented by circulating cement back up to the surface.

Q Has that been true of all the wells that have been drilled on these leases?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6651

ALBUQUERQUE, NEW MEXICO

A That's right.

Q They have all been completed by setting 4 $\frac{1}{2}$ " casing and cement clear to the top?

A And perforating the pay zones.

Q Have all these wells been fracked?

A Yes, sir.

Q Why have you selected the wells as you have, that is two wells in Section 11 and four wells in Section 14, to constitute the pilot?

A The pattern that we're showing here is a 40 acre pattern which is rather wide. One of the main purposes of this pilot is to determine the injectivity into the Queen sand. To utilize the wells that we already have to hold down the additional development that might be required, we are starting out with a pattern that's a 40 acre pattern. The area in Section 14, of course, constitutes one five spot. The area in Section 11, we have two injection wells which will be utilized to test injectivity and then will be offset by producing wells. But the big problem we face right now is trying to find out how much water we can get in the ground into this particular formation.

Q And by using the wells that you have designated, you can utilize the present wells without drilling additional wells?

A That's right.

Q In order to test it out? A That's right.





Q Where do you propose to get your water supply for injection purposes?

A We're getting water supply from two fresh water wells drilled by Whaley Company on their A Lease and they will furnish --

Q Does that adjoin this lease?

A It's an offset to these leases.

MR. IRBY: What company was that water from?

A The Whaley Company. They have water supply available that will give us as much as a thousand barrels a day.

Q If the water supply is not available or you can not secure an adequate supply from the Whaley Company, do you anticipate drilling additional wells?

A We are going to drill additional wells on our own leases, or that is Mr. Robertson's leases.

Q To what formation?

A To the shallow Yates formation, which is supplying the fresh water.

Q That lies at approximately what depth?

A 120 to 150 feet.

Q Are you convinced that fresh water will work in this particular case?

A We intend to start this project with fresh water. There has been some discussion as to whether fresh water or salt water would be the best type to use in this reservoir. We're going to



start with fresh water. However, we do know that Devonian water may be made available from the Chisum Pool to the East and that is a salt water formation, and in the event we find that fresh water is detrimental to the reservoir, we will be in a position during the pilot to switch over to salt water.

Q Do you know whether or not you have complied with the Commission memorandum 558 dated January 1st, 1958 for sending a copy of your water analysis to the State Engineer?

A Yes, sir, we have.

MR. HINKLE: I'm not sure whether a copy of the analysis was filed with the application or not.

MR. UTZ: I don't believe it was.

MR. HINKLE: We would like to have identified at this time as Exhibit No. 5 a copy of the water analysis.

(Marked Mr. Robertson's Exhibit No. 5, for identification.)

Q Referring to Exhibit No. 5, is that the water analysis which was sent to the State Engineer?

A Yes, sir, it is.

Q Do you have any recommendations to make to the Commission with respect to the establishment of a project allowable?

A Well, sir, we would like to suggest or recommend that the area shown outlined in red on our various exhibits be set up for as an administrative unit and that the present allowable regulations



that are applicable to this type of a project be granted for this particular area.

Q In other words, you are not asking for exception to the existing Commission rules with respect to the project?

A No, sir, we are not.

Q Do you intend to expand the project, the pilot, in the event it does prove to be successful?

A We do intend to expand it to encompass as much of the area outlined in red as practicable.

Q That would entail the designation of additional injection wells?

A Yes, sir.

Q And perhaps the drilling of some additional wells or producing wells?

A Well, it will require drilling of both.

Q Is it your intention to expand it or would like to expand it administratively after this is designated as a project area?

A Yes, sir.

Q In the event the proposed water flood project is successful, in your opinion would it be in the interest of conservation and prevention of waste?

A Yes, sir.

Q In your opinion, if successful, would it cause the greatest ultimate recovery of oil from the area?



A Yes, sir, certainly would.

Q Were all of these exhibits prepared by you or under your direction?

A Yes, sir, they were.

MR. HINKLE: We would like to offer in evidence Mr. Robertson's Exhibits 1 through 5.

MR. UTZ: Without objection, Exhibits 1 through 5 will be entered into the record.

MR. HINKLE: That's all we have.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Prentice, where did you say you were going to get your water?

A From the Whaley Company A Lease.

Q Do they have one water well there?

A They have two water wells, shallow water wells that have been completed in the area which they have agreed to utilize to furnish water to this particular pilot.

Q What's the location of those wells?

MR. ROBERTSON: I know the approximate location.

MR. UTZ: Well, is it in the 40?

MR. ROBERTSON: Yes, one is in the Southeast 40 of the Whaley Company Lease.

MR. HINKLE: We believe the location is in the



Southeast of Section 10, that is 11, 27.

MR. UTZ: That's one well. Both wells are in that quarter?

MR. ROBERTSON: The other well would be in the middle of the South Half of the North 80.

Q Of which section? A Section 10.

Q The location is what, the South Half of the North 80?

MR. HINKLE: It would be in the North Half of the Southeast Quarter of Section 10.

MR. UTZ: I see.

Q If you can't use fresh water, where did you say you intended to get your Devonian salt water?

A From the Chisum Pool which is out there to the East.

Q How far away is that?

A You'll note the Devonian wells are indicated by a symbol.

MR. HINKLE: That's on Exhibit 1?

A On all the exhibits.

Q That is in Section 13? A Section 13.

Q Actually it would seem that your response from your Nos. 1 and 3 injection wells would take quite a while. Would I be correct in that assumption?

A That's right, unless we go ahead and drill the producing well location shown as an offset directly South of those two wells.

Q Actually, you probably would get more information out



of those by just checking the injectivity of the formation?

A That's right.

Q You do intend, do you not, in Section 14, the Northwest Quarter, to actually use that as a pilot flood?

A Yes, sir.

MR. UTZ: Any other questions of the witness?

MR. PAYNE: Yes, sir.

BY MR. PAYNE:

Q Mr. Prentice, the Hanson, ~~Waters~~ and Williamson water flood is in this area, isn't it?

A I believe it is to the Southwest.

Q Do you have any information as to the success or failure of that particular project?

A I have no information on it, sir.

Q If you expand your project, all your expansion is going to be within the area outlined in red?

A That's correct.

Q Now, are you going to inject through your 4½" casing?

A In this pilot we are going to try it through the casing and we are also going to try it as a dual program underneath a packer and on top of the packer down the annulus. I think your Exhibit No. 4, the core graph, will indicate three zones, the lower zone having a higher permeability, and we are thinking in terms of setting a packer between those, the second and the third



zone, and injecting into the tighter formations through the annulus and underneath the packer through the looser formations to try to stabilize the flood.

Q You are going to inject into the entire Queen formation?

A Yes, sir.

Q Are those old wells?

A No, sir, not relatively speaking. They were drilled within the last year.

Q So you do feel that you should pressure test the casing? Was new casing used in the wells?

A Yes, sir, they have all been fracked and no evidence of any splits in the pipe.

Q And the cement was circulated?

A Yes, sir.

Q Do you think it might be advantageous to actually treat this as two separate pilot water floods rather than one, inasmuch as there's actually not much relationship between your proposed injection wells in Section 11 and those in Section 14?

A Well, if the Commission would wish to do it that way we certainly would have no objection. I think it's a matter of trying to set it up now so that we can expand it as an administrative unit on down the road.

Q Do you have any idea of the ultimate recovery that you expect from this water flood operation?



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A You are referring to the pilot area or the whole?

Q Actually the whole red outline, assuming the pilot area proves relatively successful.

A I would say that you are thinking in terms of something in excess of a million barrels.

Q I believe you testified you had something to do with some studies in the Brown Pool, is that right?

A That's correct.

Q That's a rather similar reservoir, isn't it?

A Very similar.

Q Do you know how Mr. Brown has fared in his water flood project in that pool?

A I am on retainer to Mr. Brown and handled that particular flood. Our feeling to date is that we're quite encouraged with what has transpired inspite of some difficulties.

Q You are still in the process of some fillup though, is that right?

A Yes, sir. Although we have established stimulation.

Q You believe that your proposed plan of injection here will adequately protect all the fresh waters above the producing zone?

A Yes, sir.

Q That being the Yates, are there any other shallow fresh waters in the area other than the Yates?





A Not to my knowledge.

Q You don't feel it is necessary as a safety feature to inject through tubing?

A No, sir.

Q What are your injection pressures going to be, do you have any idea?

A The anticipated injection pressure would be 540 pounds surface pressure, the very maximum that I can envision would be around 700.

Q What are the depths of these wells, Mr. Prentice?

A They'll come in from 950 to 1,000.

Q You propose to inject in the neighborhood of 100 barrels per day per well?

A That's right.

MR. PAYNE: Thank you. That's all.

MR. HINKLE: One other question.

REDIRECT EXAMINATION

BY MR. HINKLE:

Q Mr. Prentice, do you know whether or not notice was given to all the offset operators in connection with the application that was filed?

A Yes, sir.

Q Did you have any objection or protest or indication of cooperation from them?



A I have heard from all of the offset operators either verbally or in writing that they have no objection to the proposed pilot program.

Q Do they indicate that they would cooperate?

A They indicated they would cooperate on a lease line program.

MR. HINKLE: That's all.

RE-CROSS EXAMINATION

BY MR. UTZ:

Q In the event you used Devonian salt water as injection fluid, would you still propose to inject through the casing?

A The analysis that we have in the Devonian water, I think you have that down there, indicates that it would not be excessively corrosive, which is what we are concerned about. It does have a high CO<sub>2</sub> content, but it is not high in H<sub>2</sub>S.

Q You don't think it should be treated?

A Very definitely it would be treated, but I think that the treated water would be of such a nature that we could inject down the annulus if we wanted to. Now, as I said, in the pilot we're going to try this split injection program. We may find it's not necessary at all, in that case if we had to we could move our packer up the hole and inject underneath the packer, if we ran into the problem of excessive corrosion in the annulus.

MR. UTZ: Any other questions?

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REDIRECT EXAMINATION

BY MR. HIPPLE:

Q I believe you stated that in all these wells they are cemented clear to the top?

A Yes.

Q If the salt water was injected and did have corrosive properties and did corrode the casing, it would still be cemented?

MR. UTZ: How much pressure will your 4½" casing stand?

A I haven't any information.

MR. UTZ: It won't stand very much, not the type of well you cement oil wells with.

A We both agree that it will be better than not to have the casing corrode though.

Q You expect to treat the water?

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

Q Is this 4½" casing the only casing in the hole?

A Yes, Sir.

Q No surface casing?

A That's correct.

MR. IRBY: The State Engineer would recommend that the applicant be denied the privilege of injecting salt water through the casing as appears to be the proposal here as an alternative. We would offer no objection to the injection of the water from the Whaley Lease being injected in the manner set forth by the witness.



We feel that the fresh waters that are in this area will be placed under a threat of contamination unless the injection program or casing program is modified in the event that the Devonian water is used for injection. We so recommend to the Commission that that be their decision.

REDIRECT EXAMINATION

BY MR. PAYNE:

Q You have no particular reason to believe, Mr. Prentice, that salt water would be superior to fresh water in this project at the present?

A No, sir, I do not.

Q In fact, generally speaking fresh water is generally more satisfactory, isn't it?

A I can't answer that with a yes or not. In this particular formation in the Queen, which is part of its cementing material, the matrix is salt. We feel that the fresh water would be more advantageous than salt water. In other words, as a choice I would rather use fresh water than salt water in the reservoir.

Q Do you know what Mr. Hanson is using in his project?

A It's my understanding that they are using salt water, but I don't know.

MR. ROBERTSON: I'm familiar with that if you would like me to answer the question.

MR. PAYNE: Go ahead.



MR. ROBERTSON: To your first question about Hanson, they have not started the injection. They anticipate starting it in the month of June. They have ordered their equipment. They have entered an old Cobb well and are producing water producing water from the Glorietta and the Devonian both, and they intend to inject that as salt water as a pilot into two wells. That is my understanding of the Hanson. They should possibly by the first of July start their injection program.

MR. PAYNE: Thank you.

MR. UTZ: Mr. Irby, would the State Engineer look with favor on the injection of salt water through the tubing in 4 $\frac{1}{2}$ " casing?

MR. IRBY: We would have no objection providing the packer on this tubing is set below the fresh water zone.

MR. UTZ: What do you anticipate your injection volumes to be, Mr. Prentice?

A Approximately 100 barrels per day per well.

MR. UTZ: You could get that through 2-3/8 all right?

A Yes, sir, roughly, per foot of sand.

MR. UTZ: Any other questions? If not, the witness may be excused.

(Witness excused.)

MR. UTZ: Any other statements to be made in this case?

The case will be taken under advisement, and take a ten minute recess.



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ALBUQUERQUE, NEW MEXICO

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 7th day of June, 1960.

*Ada Dearnley*  
Notary Public-Court Reporter

My commission expires:  
June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1874 heard by me on June 1, 1960.  
*Amelia J. [Signature]*  
Examiner  
New Mexico Oil Conservation Commission

