

CASE 3214: Application of CARTER
FOUNDATION PRODUCTION COMPANY FOR
A WATERFLOOD PROJECT.

*copy of
mail*

CASE NO.

3214

Application,

TRANSCRIPTS,

Small Exhibits

ETC.

CARTER FOUNDATION PRODUCTION COMPANY

FIELD OFFICE

P. O. BOX 900

KERMIT, TEXAS

Amon G. Carter Jr., President
Walter Claer, Vice President
Katrine Deakins, Secretary-Treasurer

Oct. 5th, 1965.

Roy E. Carter,
Field Manager

HOME OFFICE ADDRESS
P. O. BOX 1036
FORT WORTH, TEXAS

Mr. Joe D. Ramey,
Supervisor and
Proration Manager,
Oil Conservation Commission,
P. O. Box 2045,
Hobbs, New Mexico.

Case No. 3214,
Order R-2883.

Hill "M" Federal Lease,
Teague Simpson Field,
Lea County, New Mexico.

Dear Mr. Ramey:--

We are now receiving evidence of stimulation from our water injection on subject lease and request an increase in the allowable as indicated below for each of the producing wells in the project; for the month of October, 1965:

<u>Well No.</u>	<u>Current Allowable</u>	<u>Current Tests</u>	<u>Requested Allowable</u>
1	22	22	25
3	9	16	20
4	6	60	75
Total	37	98	120

We shall appreciate it if you can make these increases effective October 1st, 1965, we shall be glad to notify you of any material change in production from these wells.

Yours very truly,

CARTER FOUNDATION
PRODUCTION COMPANY

BY *[Signature]*

cc - Oil Conservation Commission,
P. O. Box 871,
Santa Fe, New Mexico.

OIL CONSERVATION COMMISSION

P. O. BOX 871

SANTA FE, NEW MEXICO

October 15, 1965

Mr. Tom McKenna
Attorney at Law
302 East Palace Avenue
Santa Fe, New Mexico

Dear Sir:

Reference is made to our letter of April 5, 1965, regarding the maximum allowable which the Carter Foundation Production Company Teague Simpson Waterflood Project authorized by Order No. R-2883 will be eligible to receive.

We erroneously stated that the maximum allowable would be 634 barrels per day. This should be corrected to 687 barrels per day.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/DSW/ir

cc: Oil Conservation Commission
Hobbs, New Mexico

Case File 3214

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

April 5, 1965

C
O
P
Y

Mr. Tom McKenna
Attorney at Law
302 East Palace Avenue
Santa Fe, New Mexico

Dear Sir:

Reference is made to Commission Order No. R-2883, recently entered in Case No. 3214, approving the Carter Foundation Production Company Teague Simpson Waterflood Project.

Injection into the two authorized water injection wells is to be through tubing and packers, and the tubing shall be internally plastic coated on or before March 1, 1966.

As to allowable, our calculations indicate that when both 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 301-E-3 is 634 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

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

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Mr. Tom McKenna
Attorney at Law
302 East Palace Avenue
Santa Fe, New Mexico

April 5, 1965

C
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P
Y
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

ALP/ir

cc: Mr. Frank Irby
State Engineer Office
Santa Fe, New Mexico

Oil Conservation Commission
Hobbs, New Mexico

State of New Mexico
Oil Conservation Commission



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

March 25, 1965

Re: Case No. 3214
Order No. R-2883
Applicant:
Carter Foundation Prod. Co.

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

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

Carbon copy of order also sent to:

OTHER _____

Feb 12 1965

Chas 324

RECEIVED
FEB 12 1965
Date 2-26-65

Mr. Roy E. Carter
Carter Foundation Production Company
P. O. Box 900
Kermit, Texas

Dear Mr. Carter:

Receipt of a copy of your application to the New Mexico Oil Conservation Commission seeking permission to inject water into the Simpson formation in pour Hill No. 2M and Hill No. 3MD wells is gratefully acknowledged. The application states that the injection water will be produced water from the Ellenburger formation. Although I have no analysis of this water, I am assuming that it is probably a highly corrosive fluid. I would appreciate receiving a copy of the analysis of the Ellenburger water and would appreciate knowing whether you intend to use internally coated tubing.

Very truly yours,

S. E. Reynolds
State Engineer

FEI/ma
cc-Oil Conservation Comm.

By:
Frank E. Irby
Chief
Water Rights Div.

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. 3214
Order No. R-2883

APPLICATION OF CARTER FOUNDATION
PRODUCTION COMPANY FOR A WATER-
FLOOD PROJECT, LEA COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on March 10, 1965, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 25th day of March, 1965, 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, Carter Foundation Production Company, seeks permission to institute a waterflood project in the Teague-Simpson Pool by the injection of water into the Simpson formation through two injection wells in Section 34, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico.

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

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

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CASE No. 3214

Order No. R-2893

(5) 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.

IT IS THEREFORE ORDERED:

(1) That the applicant, Carter Foundation Production Company, is hereby authorized to institute a waterflood project in Teague-Simpson Pool by the injection of water into the Simpson formation through the following-described two wells in Section 34, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico:

Carter-Hill Well No. 2-M, located in Unit B
Carter-Hill Well No. 3-MD, located in Unit G

(2) That the subject waterflood project shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

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

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

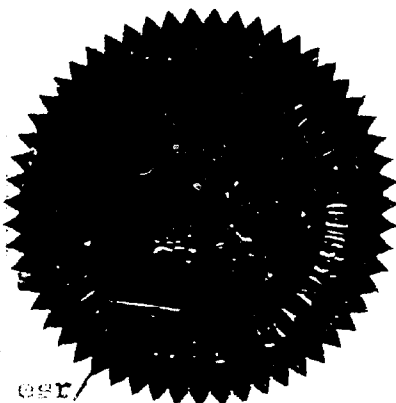
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M. Campbell
JACK M. CAMPBELL, Chairman

Guston E. Hays
GUSTON E. HAYS, Member

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



esr/

Case 3214

Heard 3-10-65

Rec. 3-10-65

1. Grant Carter foundation permission to convert two wells to injection and to inject water into the Deague Simpson oil Pool.

See wells:

Carter - Hill # 2M - B-34-235-37E.

- - - # 340-G - - -

2. The water shall be injected thru tubing & under a packer above the Simpson pay. Tubing need not be internally coated until after March 1, 1966. No water shall be injected after this date unless tubing is glassed coated internally.

3. Shall be operated in accordance with Rule 701.

Trusting

Docket No. 7-65

DOCKET: EXAMINER HEARING - WEDNESDAY - MARCH 10, 1965

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

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

CASE 2764: (Reopened and continued from the February 10, 1965 Examiner Hearing)
In the matter of Case No. 2764 being reopened pursuant to the provisions of Order No. R-2439, which order established temporary 640-acre spacing units for the West Jal-Strawn Gas Pool, Lea County, New Mexico, for a period of two years. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

CASE 3203: (Continued from the February 10, 1965 Examiner Hearing)
Application of Schermerhorn Oil Corporation for a non-standard location and a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of an 80-acre non-standard gas proration unit comprising the N/2 NE/4 of Section 5, Township 19 South, Range 37 East, Edmont Gas Pool, Lea County, New Mexico, to be dedicated to its Linam G Well No. 1 at a non-standard location 1025 feet from the North line and 1953 feet from the East line of said Section 5.

CASE 3214: Application of Carter Foundation Production Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Teague-Simpson Pool by the injection of water into the Simpson formation through two injection wells located in Units B and G of Section 34, Township 23 South, Range 37 East, Lea County, New Mexico.

CASE 3215: Application of Gulf Oil Corporation for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Mescal Wash Unit Area comprising 21,446 acres, more or less, of Federal, State and Private lands in Townships 25 and 26 South, Ranges 22 and 23 East, Eddy County, New Mexico.

CASE 3216: Application of Gulf Oil Corporation for a waterflood expansion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the expansion of its West Pearl Queen Unit Waterflood Project, Pearl Queen Pool, Lea County, New Mexico, to include the NW/4 of Section 28, Township 19 South, Range 35 East; applicant further seeks authority to convert two additional wells to water injection, said wells being located in Units D and E of said Section 28.

CASE 3217: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to permit S. S. Sutton, dba Eddy Oil Company and all other interested parties to show cause why the Eddy Oil Company Standind-State Wells Nos. 1 and 2, located in Units G and J, respectively, of Section 36, Township 19 South, Range 30 East, Eddy County, New Mexico, should not be plugged in accordance with a Commission approved plugging program.

- 2 -

MARCH 10, 1965 EXAMINER HEARING

CASE 3218: Application of Newmont Oil Company for a non-standard location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its Fidel Well No. 5 as a water injection well to inject water into the Lower Grayburg and Upper San Andres formations in its East Square Lake Waterflood Project, at a non-standard location 50 feet from the North line and 50 feet from the East line of Section 29, Township 16 South, Range 31 East, Eddy County, New Mexico.

CASE 3219: (Continued to the March 24, 1965 Examiner Hearing)
Application of Humble Oil & Refining Company for a waterflood expansion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its State "M" lease waterflood project by the conversion to water injection of 13 additional wells located in Sections 19, 20, 29, 30 and 31, Township 22 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CARTER FOUNDATION PRODUCTION COMPANY

P. O. Box 900

Kermit, Texas

February 4, 1965

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

Gentlemen:

The Carter Foundation Production Company requests that a Hearing date be set for permission to inject water into the Simpson formation in their Hill #2M and Hill #3MD at an approximate depth of 9300' to 9500'. These wells are prorated in the Teague Field in Section 34, Township 23-South, Range 37-East, Lea County, New Mexico.

Attached is a plat, showing all wells within a two-mile radius of the injection with appropriate designations as to present producing horizons and of all other horizons that have produced oil or gas.

Diagrammatic sketches of the casing pattern and perforations of the injection wells are enclosed, together with electric logs of the wells.

The injection water will be obtained as produced water from the Ellenburger formation. It is estimated that approximately 1000 barrels of water per day will be injected into each input well.

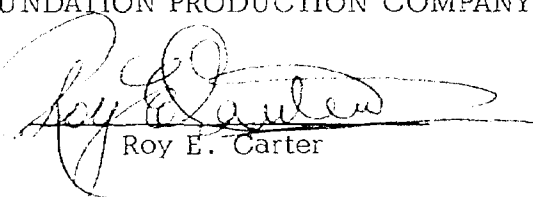
A copy of this application has been furnished the State Engineer's office, Box 1079, Santa Fe, New Mexico.

Please advise the date the Hearing will be processed.

Yours very truly,

CARTER FOUNDATION PRODUCTION COMPANY

By:


Roy E. Carter

REC:jd

Attch -

cc: State Engineer
P. O. Box 1079
Santa Fe, New Mexico

New Mexico Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

DOCKET MAILED

Date _____



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

March 1, 1965

S. E. REYNOLDS
STATE ENGINEER

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, N. M.
87501

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

Reference is made to the application of Carter Foundation
Production Company seeking permission to inject water from
the Ellenburger formation into their wells Hill #2M and
Hill #3 MD which are located in Section 34, Township 23
South, Range 37 East.

This office offers no objection to the granting of the appli-
cation provided both wells are equipped as indicated on the
schematic drawings dated 2-1-65 and provided the tubing is
internally coated.

Very truly yours,

S. E. Reynolds,
State Engineer

By


Frank E. Irby

Chief

Water Rights Division

FEI/mls

cc: Carter Foundation Production Co.

March 1, 1965

87501

Roy E. Carter, Field Manager
Carter Foundation Production Co.
P. O. Box 900
Kermit, Texas

Dear Mr. Carter:

Your letter of February 25, 1965 concerning your application to inject water from the Ellenburger formation into your Hill #2 M and Hill #3 MD wells is gratefully acknowledged. The analysis of the water is appreciated.

Very truly yours,

S. E. Reynolds,
State Engineer

By Frank E. Irby
Chief
Water Rights Division

FEI/mls

cc: Oil Conservation Council

ROBERT D. FITTING & ASSOCIATES

Petroleum Engineering & Geological Consultants

MIDLAND, TEXAS 79704

March 15, 1965

File 3214

New Mexico Oil Conservation Commission
State Land Office Bldg.
College Avenue
Santa Fe, New Mexico

Attention: Mr. D. S. Nutter, Chief Engineer

Re: Case 3214 - Application of
Carter Foundation Production Co.
for a Waterflood Project in the
Teague-Simpson Pool, Lea County,
New Mexico

Gentlemen:

In connection with the captioned waterflood project, we are enclosing a copy of water analyses taken by Martin Water Laboratories on the Carter Foundation Production Company, Hill (Ellenburger) Lease, Lea County, New Mexico.

If you have any questions or desire additional information, please let us know.

Very truly yours,

Ven O. White

Ven O. White

VOW:jd
Encl -

MARTIN WATER LABORATORIES

Box 1468

Monahans, Texas

WI 3-4781

RESULT OF WATER ANALYSES

To: Mr. Roy E. Carter
P. O. Box 900, Kermit, Texas
Company Carter Foundation Production Company Lease Hill (Ellenburger)
County Lea State New Mexico

Source of Sample and Date Taken:
Pit Water - 12-31-64

CHEMICAL AND PHYSICAL PROPERTIES

Specific Gravity at 60 degs. F	1.1471
pH When Sampled	6.9
pH When Received	6.9
Total Alkalinity as CaCO ₃	50
Supersaturation as CaCO ₃	7
Undersaturation as CaCO ₃	-
Total Hardness as CaCO ₃	47,729
Calcium as CaCO ₃	36,919
Magnesium as CaCO ₃	10,810
Sulfate as SO ₄	370
Chloride as NaCl	206,033
Iron as Fe	6.6
Barium as Ba	0.0
Turbidity Electric	16.6
Color as Pt	2.3
Temperature Degs. F.	97
Carbon Dioxide, Calculated	13
Dissolved Oxygen, Winkler	0.0
Hydrogen Sulfide	0.0
Resistivity OHMS/CC at 60 Degs. F.	9.2
Total Suspended Oil	18.5

All Results Reported as Parts Per Million

By /S/ Waylan C. Martin, M.A.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 325-1182

SANTA FE, N. M.
PHONE 983-3971

ALBUQUERQUE, N. M.
PHONE 743-6691

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 10, 1965

EXAMINER HEARING

IN THE MATTER OF:

APPLICATION OF CARTER FOUNDATION PRODUCTION
COMPANY FOR A WATERFLOOD PROJECT, LEA
COUNTY, NEW MEXICO

Case No. 3214

BEFORE:

ELVIS A. UTZ

TRANSCRIPT OF HEARING



dearnley-meier

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

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-6691 • ALBUQUERQUE, NEW MEXICO

MR. UTZ: Case 3214.

MR. DURRETT: Application of Carter Foundation Production Company for a waterflood project, Lea County, New Mexico.

MR. McKENNA: My name is Tom McKenna, with McKenna & Sommer, Santa Fe, appearing on behalf of the applicant; and I have one witness, Mr. Ven O. White.

* * *

V E N O. W H I T E, the witness, having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. McKENNA:

Q What is your full name?

A Ven O. White.

Q By whom are you employed?

A Employed by Robert D. Fitting & Associates in Midland.

Q What are they--what do they do?

A We are a firm of consulting engineers, doing engineer work for Carter Foundation Production Company.

Q And you are employed at Midland?

A Yes.

Q What position do you have with Mr. Fitting & Associates?

A I am classified as a reservoir engineer.

Q Have you testified before this Commission in the past?

A No, I have not.

Q Would you give the Examiner and Commissioners a brief rundown of your education and experience.

A I graduated from the University of Houston in 1962 with a B.S. in Petroleum Engineering. I worked for Atlantic Refining Company in Midland for two years, in the reservoir department. I was with Forrest Oil Corporation for six years in Midland, in the secondary recovery department, and have been with Mr. Fitting for almost five years.

MR. McKENNA: Mr. Examiner, I ask if the qualifications of the witness meet the approval of the Commission.

MR. UTZ: Yes, sir.

MR. McKENNA: Mr. White, are you familiar with this application and the subject matter thereof?

A Yes, I am.

Q Can you briefly explain to the Examiner and the Commissioners the purpose of Case Number 3214, and this application by Carter Foundation Production Company.

A The application is made for permission to inject water into the Simpson Formation in two wells on the Carter Foundation Production Company Hill Lease located in Section 34

of Township 23 South, Range 37 East. The production from the Simpson wells on this particular lease is averaging less than seven barrels per well per day, and all wells are on gas lift.

Q Mr. White, have you prepared some exhibits or have exhibits been prepared under your direction in this case, with this application?

A Yes, they have.

Q I hand you what has been identified as Exhibits 1 through 5. Are these the ones that have been prepared by you or under your supervision?

A They are.

Q Would you explain those to the Commission, please, Mr. White.

A There are two plans in the exhibit that were not furnished with the application--a structure map and an isopach map. Exhibit 1 is an area map showing all wells in the vicinity of the subject lease that are producing or have been producing. Exhibit 1, the areal map, shows all wells that are producing or have produced, and the formations from which these have produced oil or gas. Exhibit 2 is a structure map on a marker at the top of the McKee Sand which indicates a north-south trending anticline with production being limited on the east by what appears to be a fault. Exhibit 3 is an isopachous map of the McKee Sands themselves. Production to

the north and west of the subject lease is limited by an absence of sand, so that the structure does not necessarily control the limits of the production--it is limited by the sand development itself. The lease to the north of Carter's Hill lease was produced by Gulf but has been abandoned for approximately a year, or there has been no production from it in the past year. We would like to get permission to inject water into the wells Number 2M and 3MD in an attempt to re-pressure the Simpson formation under this particular lease. It isn't a waterflood as such because we're not going to make any attempt to make a pattern flood. What it will be is more of a pressure maintenance operation.

Q How many wells do you have on the lease?

A Six wells have produced from the Simpson formation on this lease. There are five producing at the present time.

Q Now, Mr. White, if you would take a look at your Exhibits 4 and 5 which are diagrammatic sketches, and explain in detail how the proposed project will work.

A We propose to run tubing on packers in the wells, set above the perforations in the McKee Sands, and inject water into them in the manner shown on the schematic diagram here.

Q Would you go into a little more detail, Mr. White. Is there anything in addition that you want to say about the proposed project, and how you plan to put it into effect?

A The source of water that we plan to use is produced Ellenburger water from the Hill lease. The McKee Sand itself is very consolidated, fine grain sand and does contain considerable clays that are readily hydrated by fresh water. We had to find a source of water that was saline in an attempt to prevent hydration of the clays in the sand itself, and the Ellenburger water was the only source we could find. We have run Reda pumps in to the Ellenburger wells and are recovering oil from the Ellenburger that would not be recovered had we not been able to find a use for the water, so the project will serve a two-fold purpose in getting additional oil recovery from the field. We will get additional oil from the Ellenburger by being able to produce it for a source of water for the McKee, and hope to increase reservoir pressure in the McKee formation and in the Simpson formation itself, in order to stimulate production in the presently producing well.

MR. PORTER: Do you expect to carry the Ellenburger to a lower economic limit?

A Yes. At the time we ran a pump in the west well there was only one Ellenburger well producing--it was making 20 to 25 barrels of oil per day and about 125 of water. We do have two wells producing now, averaging between 200 and 250 barrels of oil per day.

MR. McKENNA: What has been the past production on

these wells? How much have you recovered?

A The lease has recovered 467,000 barrels.

MR. PORTER: Is that from the Simpson?

A Yes, sir.

MR. MCKENNA: And how much do you estimate you will recover by virtue of the secondary program for which you are asking approval today?

A If the program is successful we should be able to match the primary recovery--at least, volume calculations indicate that there should be on the order of 15,000,000 barrels in the McKee in original oil in place in the formation. The total production from the area of the field that we are interested in has been 531,000 barrels. That does include oil produced by the Atlantic Refining Company on the Goins lease, so the recovery from the McKee hasn't been but from three to five% of the original pile. If we can match primary recovery it will be a successful operation, but the chances of exceeding primary if the project works, is very good.

Q So you would say on the basis of the feasibility study, that you have a reasonable expectation of one-to-one recovery?

A Yes.

Q Do you have any idea or do you have an estimate of the flood life of the program?



A I would say the life of the program would be a minimum of ten years.

Q Assuming that approval was given for injection, do you have any idea when you might get some response?

A We should get an indication of response in our Well Number 3M, or 3 EM, it is. It is drilled on the same proration unit the 2M will be injecting into. I think there's not but about 100 feet between the two wells, and we should be able to pick up an indication of stimulation very rapidly, although it will probably take from a year to a year and a half to get maximum stimulation from the area.

Q So it would be your estimate that the peak of the program should be a year to a year and a half?

A Yes.

Q Would it be your opinion, based upon past production, geology and current status of production, that this is a favorable program--that it will work?

A Yes, I believe it will work.

Q Do you have an opinion as to whether or not this would be in keeping with principles of conservation and economics of the oil business?

A I certainly do. There will be much additional oil recovered that would be otherwise left in the ground and wasted if the program isn't put in, in both the Ellenburger

and the Simpson formations.

Q Do you see any injuries to any correlative rights that may occur under this program?

A No, none at all.

Q Is there anything else you wish to tell the Commission concerning the proposed program? Do you wish to make any further reference to your exhibits or any further reference to your plan for the project?

A No, I feel it has been pretty well covered. If there are any questions, I would be glad to answer them for the Commission.

Q What is the formation which is immediately above the Simpson? Is that the Devonian?

A The next producing is the Devonian.

Q Do you think there is any possibility of injury to this formation by virtue of the proposed program?

A No, sir.

Q Do you feel there is any possibility of injury to any formations which might lie below the proposed project?

A No.

MR. McKENNA: Mr. Examiner, are there any questions of the witness?

MR. UTZ: Do you want to offer your exhibits in evidence?

MR. MCKENNA: I will offer Exhibits 1 through 5, inclusive.

MR. UTZ: Without objection, Exhibits 1 through 5 are entered into the record of this case.

CROSS-EXAMINATION

BY MR. UTZ:

Q What size tubing do you intend to install in these injection wells?

A I have 2½-inch tubing for one well, and 2-inch for the second.

Q Which is which?

A The 3ND should have the 2½-inch.

Q Will this tubing be internally plastic coated?

A We do have 2½-inch tubing, plastic coated; the two-inch isn't at this time. For pilot injection purposes we felt we could use bare tubing until we established the pattern of injection that we would be able to maintain. The production history of the Ellenburger itself hasn't indicated that the water is excessively corrosive. I mean, it's a brine water; it's very heavy and as far as being corrosive, we observed no appreciable amount of difficulty with it. We felt that we could use the two-inch tubing bare just for the pilot operation.

Q How long do you anticipate the pilot operation will

take?

A Not in excess of a year.

Q How many Ellenburger wells do you have that you were going to use produced water from?

A We have two.

Q The 1E and the 2E?

A Yes, sir.

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

MR. PORTER: I have one or two. When were these wells drilled?

A In the late forties and early fifties. The first production from the McKee was in 1952.

Q And there were no multiple completions at that time?

A No duals, no, sir.

Q You had wells drilled to the Ellenburger and others to the Simpson. Judging from your cumulative production for the Carter wells of 467,000, how many wells does that represent?

A That represents six wells.

Q I assume that probably some of those wells haven't paid out?

A Some of the wells have produced from various horizons. The 3MD well was drilled to the Ellenburger and was wet in the Ellenburger, and then completed in the McKee and abandoned in 1958 in the McKee, and produced from the Devonian

for a short period of time.

Q You say the primary recovery is only about five per cent?

A It appears to be in the neighborhood of five per cent.

Q Why do you think it was so low? A real tight formation, lack of reservoir energy, or--

A It was a solution gas drive. The solution gas was rather low, and actually production of the McKee itself has been most difficult--it's very unconsolidated sand and it's nearly impossible to put them on pump, and we found that gas life is about the only feasible way to produce them.

MR. IRBY: Frank Irby, State Engineer's Office. Mr. White, you said the anticipated life of the project was a minimum of ten years. What is your maximum estimate?

A If the recovery exceeds the primary recovery by a factor of two or three, I would say the time would be multiplied in the same manner--I would say twenty to thirty years, if we could keep it going that long.

Q You don't anticipate that the secondary will exceed the primary by more than a factor of three, then?

A Actually there's no way of telling. Using a factor of three is almost unheard of. A one-to-one is more or less a rule of thumb that has been followed for years. When I was with Forrest we evaluated a number of fluids that we had

operating and average anticipated recovery from sixty to seventy different fluids averaged one-to-one, and some of them were as low as only 50% of primary. Some of them were in excess of primary, but those were the exception rather than the rule. The one-to-one is just an average.

Q In your best professional judgment would the factor exceed three?

A I don't believe it would; no, sir.

Q Thank you. Now, you stated that the pilot operation would probably be in excess of one year. How much in excess of one year?

A As far as the pilot operation itself is concerned, I think it could be terminated by the end of a year. I think our maximum stimulation could be obtained in a year to a year and a half, but by the end of a year we should be able to tell whether or not the project will be successful.

Q Now, you said you intended to use this bare tubing in the well where you have the two-inch tubing?

A Yes, sir.

Q --Until the end of the pilot. Now, at the end of the pilot what do you propose to do about the tubing?

A If the program is continued the tubing will be lined.

Q How old is this tubing now, and what condition is it in?

A I would say it is approximately ten years old--ten to twelve years old, and is in good shape.

MR. IRBY: Thank you.

REDIRECT EXAMINATION

BY MR. McKENNA:

Q You have reached your conclusion as to the coating based upon economic factors, is that correct--is that part of the--

A That's part of the reason.

Q What would you estimate it would cost to coat the tubing in the well which is not coated at this time?

A It would run three to four thousand dollars.

Q However, your opinion, and the way you intend to proceed, is also predicated upon engineering viewpoints and feasibility studies you have made as to the project, is that correct?

A That's right.

MR. McKENNA: No further questions.

RECROSS-EXAMINATION

BY MR. DURRETT:

Q I have a question. Mr. White, you stated on direct, I believe, that the average production per well was approximately seven barrels per day?

A Yes, sir.

Q What is the best well making?

A We have a test unit in operation at the present time, testing all the wells before the program is started, and about three weeks ago we got a 22-barrel test from one well.

Q Which one was that?

A That was the Number 1, I believe--Number 1M. Now, it was re-tested again last week for 14 barrels. The production has increased somewhat after we ran a Reda pump in one of the Ellenburger wells, because we have additional gas available for lift. That has been one problem we have been having to contend with.

Q Which well is the Reda pump in?

A The 1E and the 2E, we plan to use as the source wells.

Q Those are the two source wells for water, is that correct?

A Yes.

Q I'm having a little trouble with the plat, as far as reading it. You will put on the 2M and 3MD?

A Yes, sir.

Q --Which will be your production wells. You initially will expect a response in the 3E, is that correct?

A Yes, sir.

Q And then where will be your other production wells in that area?

A The 1M and 4M are--they should receive stimulation before the 5M. The 5M is quite far removed from the injection.

Q That 3E--you expect it to water out fairly early, don't you?

A Yes.

Q And then just continue flooding on toward the direction of the 5M, is that your plan?

A Yes, it is.

Q And you do anticipate putting on additional wells after they receive a response, if your project looks like it's going to be successful?

A If we can maintain pressure--stimulate pressure in the formation with these two wells sufficiently, it wouldn't require any additional injection wells. We are not attempting a pattern flood; it's more of a re-pressuring attempt.

Q Your thinking is that these probably will be the only two injection wells?

A It's quite possible.

Q One other question. Do you have or have you conducted a water analysis on water that will come out of your producers?

A Yes. We have furnished Mr. Irby with a copy of it.

MR. DURRETT: Does the Commission have a copy of it?

MR. IRBY: I don't think so.

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MR. DURRETT: Could you send us one of those?

MR. WHITE: Yes.

MR. MCKENNA: Have you furnished the Commission also with logs on these wells?

MR. WHITE: Logs on the two proposed injection wells have been furnished.

MR. MCKENNA: Furnished to the Commission?

MR. WHITE: Yes.

MR. UTZ: Are there other questions? ... The witness may be excused. Are there any other statements in this case? The case will be taken under advisement.

* * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ELIZABETH K. HALE, Notary Public and Court Reporter, do hereby certify that the proceedings in the foregoing case were taken and transcribed by me, and that the foregoing is a true and correct transcript of proceedings to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF, my hand and seal of office this 21st day of March, 1965.

Notary Public

My commission expires
May 23, 1968.

I do hereby certify that the foregoing is a complete and correct transcript of the proceedings in the case of 3214 heard by Mr. [Signature] on 3/21/65.

[Signature]
New Mexico Oil Commission