

W 177

# Union Oil Company of California

205 EAST WASHINGTON AVENUE

LOVINGTON, NEW MEXICO 88260

June 25, 1964

MAIN OFFICE 000

1964 JUL 7 AM 7 48

Mr. A. L. Porter, Jr.  
Secretary-Director  
New Mexico Oil Conservation Commission  
P. O. Box 871  
Santa Fe, New Mexico

Re: Expansion of Waterflood Project  
Area, South Caprock Queen Unit,  
Chaves County, New Mexico (Case  
No. 2032, Orders R-1729 and R-1729-A)

Dear Mr. Porter:

The Union Oil Company of California, as Operator of the South Caprock Queen Unit in Chaves County, hereby requests administrative approval to convert an additional two wells in the waterflood project area to water injection service. This request is submitted pursuant to the provisions of Rule 701 of the Rules and Regulations of the New Mexico Oil Conservation Commission.

The new wells proposed for injection service are as follows:

1. Tract 3-A, Well 5-3 located in the SW/4 of NW/4, Section 3, T-15-S, R-31-E, N.M.P.M.
2. Tract 2, Well 9-4 located in the NE/4 of SE/4, Section 4, T-15-S, R-31-E, N.M.P.M.

Water injection at the South Caprock Queen Unit commenced on May 23, 1961, into ten wells situated along the contact between the gas cap and the oil zone. The purpose of this initial pattern was to prevent the migration and loss of recoverable secondary oil into the gas cap. Since May, 1961, the project has been expanded twelve times. The expansion orders are tabulated below:

<u>Expansion</u> <u>No.</u>	<u>Date</u>	<u>Administrative</u> <u>Order No.</u>	<u>No. of New</u> <u>Injection Wells</u>
1	4-62	WFX-102	7
2	8-62	WFX-116	5
3	12-62	WFX-124	6
4	1-63	WFX-127	3
5	3-63	WFX-134	4
6	5-63	WFX-136	1
7	6-63	WFX-138	7
8	9-63	WFX-152	9
9	10-63	WFX-158	2
10	12-63	WFX-163	7
11	2-64	WFX-164	3
12	3-64	R-2660	9

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Currently a thirteenth expansion of the project is under consideration (application dated June 22, 1964) which includes the drilling of two new water injection wells.

As of June 1, 1964, 17,994,494 barrels of water have been injected into 70 wells.

Stimulation from the water injection program has recently been observed in three additional producing wells in the project. The proposed injection wells are either direct or diagonal offsets to the stimulated wells. The location of the subject wells is shown on the attached plat (Exhibit I). The proposed injection wells are a part of the master plan of operation for the project as presented at the hearing on Case No. 2032. This was Union's application for authority to institute a waterflood project in the South Caprock Queen Unit.

In support of this application, the following exhibits are attached:

Exhibit I: A plat of the South Caprock Queen Unit showing the present project area, the proposed expansion of the project area and the location of all injection and producing wells. The newly stimulated wells and the wells to be converted to injection service are identified on the plat.

Exhibit II: Commission Form C-116 showing production tests for the stimulated wells both before and after being affected by the waterflood.

Exhibit III: The Casing Programs for the proposed injection wells.

Exhibit IV: Diagrammatic sketches of the proposed injection wells showing casing strings, casing diameters, setting depths, tops of cement and perforations. Also shown are the proposed tubing string including depth, diameter and packer. The proposed injection wells are perforated in the Queen Sand as shown on the diagrams. The water used for injection is either fresh water produced from the Ogalalla Sand or a mixture of this fresh water and produced Queen Sand brine. Anticipated injection rates and pressures are shown on the diagrams.

Exhibit V: Copy of a waiver agreement from Tenneco Oil Company, operator of the U. S. A. Reno lease located adjacent to the proposed injection wells. Since this is a Unit operation there are no other offset operators affected by the proposed expansion.

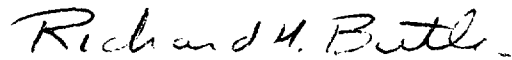
Conversion of these wells is recommended in order to continue to maintain proper control of the advancing flood front. This will permit a more efficient sweep of the reservoir in this portion of the Unit.

By copy of this application, the State Engineer is being advised of the proposed conversions. Attached is a copy of our transmittal letter to Mr. Irby of the State Engineer's office.

Porter - SCQU Expansion of Waterflood Project - 3

Three copies of this letter and supporting exhibits are transmitted herewith, as requested in Rule 701. Please contact me if any additional information is required for this application.

Very truly yours,

A handwritten signature in cursive script that reads "Richard H. Butler".

Richard H. Butler  
Unit Engineer

RHB/jj

Attachments - 6

cc: Mr. Frank Irby  
State Engineer's Office

## NEW MEXICO OIL CONSERVATION COMMISSION

## EXHIBIT II

## GAS-OIL RATIO REPORT

OPERATOR..... Union Oil Company of California POOL Caprock Queen - South Caprock Queen Unit  
ADDRESS..... 205 E. Washington, Lovington, N.M. MONTH OF..... December 1963 to June, 1964  
SCHEDULED TEST..... COMPLETION TEST..... SPECIAL TEST..... xxx (Check One)  
(See Instructions on Reverse Side)

TESTS TO VERIFY  
WATERFLOOD STIMULATION

Lease	Well No.	Date of Test	Producing Method	Choke Size	Test Hours	Daily Allowable Bbls.	Production During Test			GOR Cu. Ft. Per Bbl.
							Water Bbls.	Oil Bbls.	Gas MCF	
1. Tract 30	10-4	12-17-63	P	-	24	2	0	12	TSTM	-
	Tract 30	10-4	6-11-64	P	24	40	1	180	TSTM	-
2. Tract 2	9-4	12-20-63	P	-	24	18	0	18	TSTM	-
	Tract 2	9-4	6-9-64	P	24	18	1	56	TSTM	-
3. Tract 2	16-4	12-20-63	P	-	24	7	2	9	TSTM	-
	Tract 2	16-4	6-10-64	P	24	50	10	82	TSTM	-
4. Tract 45	8-4	6-8-64	P	-	24	3	0	3	TSTM	-
	Tract 45	8-4	6-23-64	P	24	3	0	7.5	TSTM	-

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60 degrees F. Specific gravity base will be 0.60.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission. In accordance with Rule 301 and Appropriate Pool Rules.

(I certify that the information given is true and complete to the best of my knowledge.)

Date..... June 23, 1964

Union Oil Company of California

By..... Richard H. Butler  
Richard H. Butler,  
Unit Engineer

Title

## EXHIBIT III

SOUTH CAPROCK QUEEN UNIT  
Chaves County, New Mexico

CASING DATA FOR PROPOSED  
INJECTION WELLS

WELL:	Tract 3-A, <u>Well 5-3</u>	Tract 2, <u>Well 9-4</u>
T. D. :	3171'	3166'
E.T.D.:	3158'	3166'
PERFORATIONS:	3149' - 3155'	3141' - 3151'
<u>SURFACE CASING:</u>		
Size	8 5/8"	8 5/8"
Setting Depth	315'	196'
Cement, Sacks	175	150
Circulated?	Yes	Yes
Grade Pipe	J-55	J-55
Weight, Lbs/ft	24	28
Age, Years	7½	10
Condition	New	Good
<u>OIL STRING:</u>		
Size	5½"	5½"
Setting Depth	3160'	3166'
Cement, Sacks	400	100
Grade Pipe	J-55	J-55
Weight, Lbs/ft	14	15 & 23
Age, Years	7½	10
Condition	New	Good

SOUTH CAPROCK QUEEN UNIT  
PROPOSED INJECTION WELL  
TRACT 2, WELL 9-4

Anticipated Injectivity:  
300 B/D at 1000 psig

8-5/8" C 196'  
w/150 sacks  
(circulated)

Calculated Top  
of Cement  
2416'

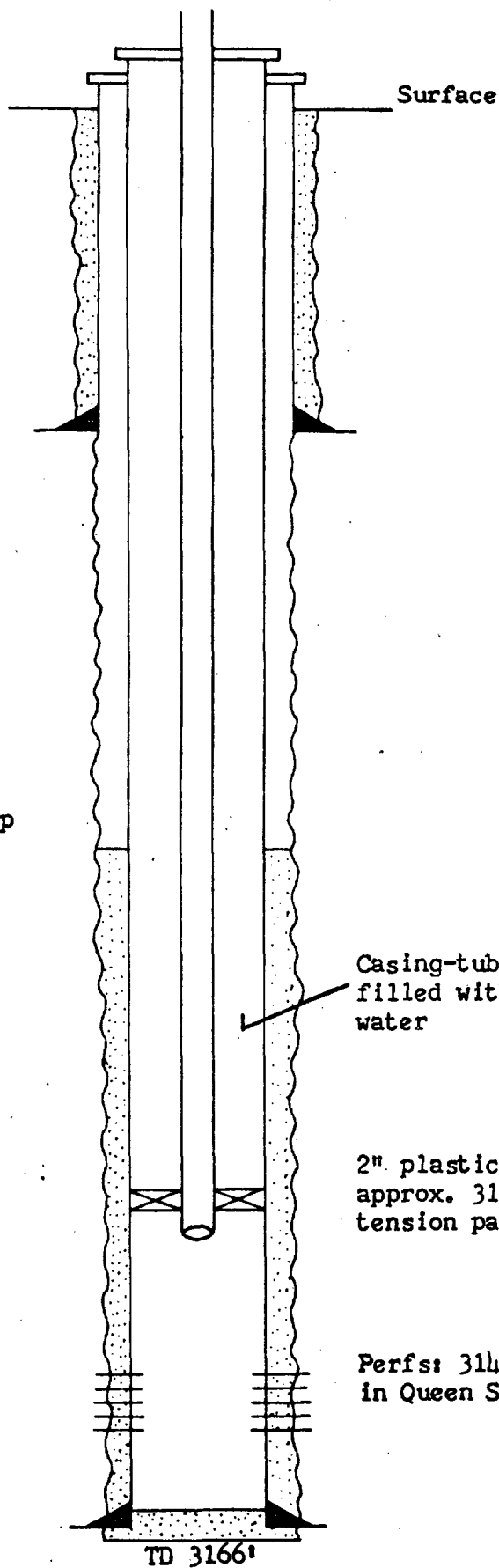
Casing-tubing annulus  
filled with inhibited  
water

2" plastic-lined tubing at  
approx. 3130' with Baker  
tension packer on bottom.

5 1/2" C 3166'  
w/100 sacks

Perfs: 3141'-3151'  
in Queen Sand

TD 3166'



SOUTH CAPROCK QUEEN UNIT  
PROPOSED INJECTION WELL

Page (2)

Tract 3-A, Well 5-3

Anticipated Injectivity:  
300 B/D at 1,000 psig

8-5/8" C 315'  
w/175 sacks  
(Circ.)

Calculated top  
of Cement  
1020'

Surface

Casing-tubing annulus  
filled with inhibited  
water

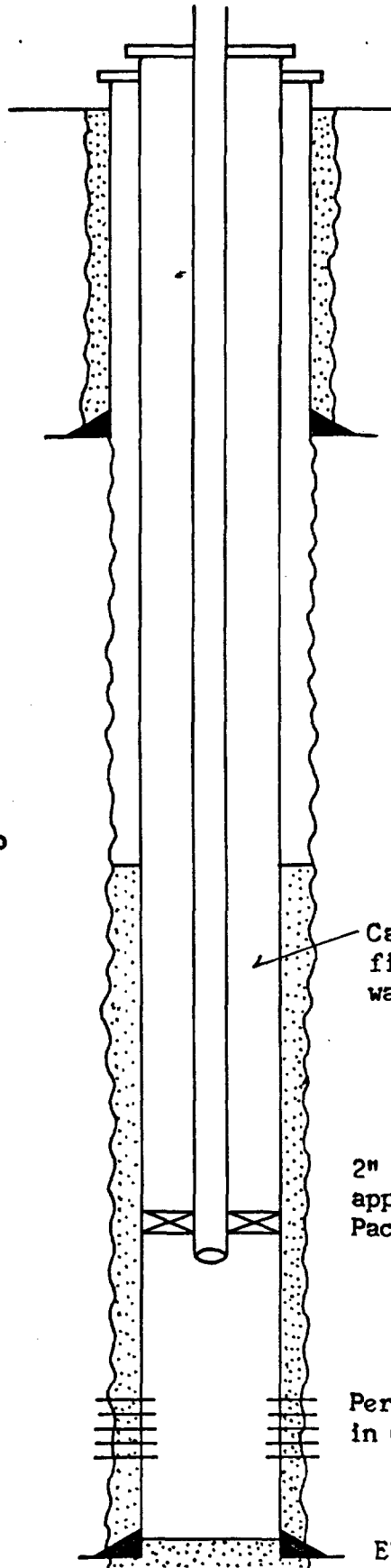
2" plastic-lined tubing at  
approx. 3140' w/Baker Tension  
Packer on bottom

Perfs. 3149'-3155'  
in Queen Sand

5 1/2" C 3160'  
w/400 sacks

ETD 3158'

TD 3171'



# Union Oil Company of California

205 EAST WASHINGTON AVENUE

LOVINGTON, NEW MEXICO 88260

June 25, 1964

Mr. Frank Irby  
Chief of Water Rights Division  
State Engineer's Office  
State Capitol Building  
Santa Fe, New Mexico

Re: Casing Data for Proposed Water  
Injection Wells, South Caprock Queen  
Unit, Chaves County, New Mexico

Dear Mr. Irby:

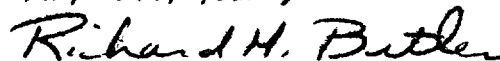
Attached please find a copy of an application submitted by the Union Oil Company of California to the New Mexico Oil Conservation Commission requesting administrative approval to expand our waterflood project in the South Caprock Queen Unit. This expansion will include the conversion of two more wells to water injection service. The application is in accordance with the provisions of Rule 701 of the Rules and Regulations of the New Mexico Oil Conservation Commission.

Exhibits III and IV of the attached application include a summary of casing information on the wells to be converted to injection service. The wells will be completed with plastic lined tubing and tension packers set just above the perforations in the Queen Sand. The annulus between the casing (oil string) and the tubing will then be filled with an inhibited water for protection against corrosion. The maximum anticipated surface injection pressure for the two wells will be 1000 psig.

Data on the age, grade and condition of the various casing strings in these wells are tabulated in Exhibit III.

If you are in agreement with this proposal, we would appreciate your so notifying the Secretary-Director of the New Mexico Oil Conservation Commission as soon as possible. Thank you for your consideration of this matter.

Very truly yours,



Richard H. Butler  
Unit Engineer

RHB/jj  
Attachments (5)  
cc: Mr. A. L. Porter, Jr. (3)



# ILLEGIBLE

## WAIVER AND AGREEMENT

This Waiver and Agreement, made and entered into this 26th day of June, 1964, by and between Tenneco Oil Company, a Delaware corporation, whose address is Fourth Floor, 201 Wall Building, Midland, Texas, hereinafter sometimes referred to as "Tenneco" and Union Oil Company of California, a California corporation, whose address is 14 West Texas Street, Midland, Texas, hereinafter sometimes referred to as "Union".

### W I T N E S S E T H, T H A T:

WHEREAS, Tenneco is the owner and holder of valid and subsisting oil, gas and mineral lease or leases covering, among other lands, the Southwest Quarter (SW/4) of Section 3, Township 15 South, Range 31 East, N.M.P.M., Chaves County, New Mexico; said lease insofar as the same covers the said Southwest Quarter (SW/4) is hereinafter referred to as "Tenneco's Lease"; and

WHEREAS, Union is the operator of the South Caprock Queen Unit which is adjacent to Tenneco's Lease and has common corners therewith, such unit is hereinafter referred to as "Said Unit"; and

WHEREAS, Union desires to convert the wells and to drill that certain well specified below in this agreement for use as injection wells for the purpose of injecting water into the Queen Sand underlying Said Unit in accordance with the unit water flooding program and desires a waiver of Tenneco for such program; and

WHEREAS, Tenneco desires to grant to Union such waiver subject to the conditions hereinafter stated.

NOW THEREFORE, for and in consideration of the actual covenants and agreements hereinafter contained and for the benefits to be derived therefrom, the parties hereto do hereby covenant, contract and agree as follows:

I.

A. Within ninety (90) days from the date of final execution hereof by the parties hereto, or within thirty (30) days after approval for such operations is obtained from the New Mexico Oil Conservation Commission, whichever is later, Union shall commence or cause to be commenced, operations for the conversion of wells designated as Unit Wells Numbered 5-3, 7-3 and 9-4 to wells capable of injecting water into the Queen Sand underlying Said Unit.

B. Concurrently with said conversion operations, Union shall drill a well to be designated as Unit Well No. 1-9 and located at a location which is One Hundred Thirty feet (130') from the North Line and One Thousand Three Hundred Five feet (1,305') from the East Line of Section 9, Township 15 South, Range 31 East, N.M.P.M., Chaves County, Said well shall be drilled to a depth sufficient to permit completion of same as a water injection well in the Queen Sand underlying Said Unit.

C. All operations by Union hereunder shall be conducted with due diligence and in a workmanlike manner at the sole risk, cost and expense of Union and Tenneco shall not be charged with any part thereof.

D. Union agrees that all water injected into or through wells which are located on tracts having a common corner or common corners with Tenneco's Lease, shall be injected at rates and under pressures mutually acceptable to Union and Tenneco.

II.

Tenneco shall have and is hereby given and granted the right to dispose of water produced from the Queen Sand underlying Tenneco's Lease subject to the following:

A. Tenneco shall construct, maintain and own a water line for the purposes of delivering water from Tenneco's Lease to a point designated by Union on its oil and produced water gathering line located in the Northwest Quarter (NW/4) of Section 3, Township South, Range 31 East, Chaves County, New Mexico.

B. All water produced from the Queen Sand underlying Tenneco's Lease shall be produced into the water gathering line at the existing pressures of said gathering line. Said water shall be

delivered through a closed system with a protection blanket. The water delivered by Tenneco hereunder shall be free as is reasonably possible from foreign substances. Proper control safeguards shall be installed on said line by Tenneco in order to maintain adequate line pressures. In no event shall Tenneco permit line pressure to exceed ninety pounds per square inch gauge (90 psig).

### III.

A. Union agrees to take all water produced from the Queen Sand underlying Tenneco's Lease so long as Union's system has capacity over and above the requirements of Said Unit.

B. Tenneco may cease disposing of water hereunder at any time by giving Union thirty (30) days prior written notice of such intention.

C. Union may cease taking water produced from Tenneco's Lease at such time as Union permanently ceases injection of water into or through all wells located on all tracts having a common corner or common corners with Tenneco's Lease provided that Union gives Tenneco not less than sixty (60) days prior written notice of Union's intention to so cease taking such water.

### IV.

Whenever, because of any cause, accident or occurrence, not within the reasonable control of a party hereto or because of any valid orders, rules or regulations of duly constituted authorities, said party is prevented from complying with any obligation imposed by this Agreement, such obligation shall be suspended so long as such cause persists; but said party hereto shall use due diligence in a good faith attempt to eliminate any such cause, it being understood, however, that no party shall be obligated to settle or compromise any labor dispute or legal action.

### V.

A. Each party shall be solely responsible for all claims, damages, causes of action of whatsoever kind, character and nature arising out of any act or omission of such party hereunder and such party shall hold the other party free from and against any and all

claims, demands, liens or encumbrances of whatsoever kind, character or nature resulting from or arising out of such acts or omissions.

B. Tenneco agrees to waive and does hereby waive any claims, rights, or causes of action that Tenneco may have against Union by reason of Union injecting water into the Queen Sand underlying Said Unit; provided, however, that such waiver shall be effective only during that period or those periods of time that Union is conducting its operations in accordance with all of the terms, provisions and conditions hereof.

C. The liabilities of the parties hereto and hereunder shall be several and not joint or collective. Nothing contained in this Agreement shall be deemed to create the relationship of an agency, partnership, joint venture or any other such entity.

VI.

This Agreement is expressly subject to all applicable laws, rules, orders and regulations of any federal, state or local authority having jurisdiction of the premises and all operations contemplated hereby shall be conducted in conformity therewith.

VII.

This Agreement shall become effective as of the 2<sup>nd</sup> day of July, 1964, and shall remain in full force and effect so long thereafter as Union shall continue to inject water into Said Unit through any injection well or wells on any tract that is adjacent to or has a common corner with Tenneco's Lease.

VIII.

Any notice or communication required or permitted hereunder shall be deemed to have been given when such notice in writing shall be deposited in the United States Mail, postage prepaid, or sent by telegram, with charges prepaid, and addressed to the parties respectively as follows:

UNION OIL COMPANY  
619 West Texas  
Midland, Texas

TENNECO OIL COMPANY  
1800 Wilco Building  
P. O. Box 1031  
Midland, Texas  
Attention: District  
Production Superintendent

IX.

This Agreement shall be deemed to be covenants running with Said Unit and the lands described hereinabove and the leases covering

said lands and shall be binding upon and inure to the benefit of the parties hereto, their respective successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed this instrument on the day and year first above written but effective as hereinabove provided.

TENNECO OIL COMPANY

By *A. N. McDowell* FORM APPROVED *AM*  
Agent and Attorney-in-Fact

**ILLEGIBLE**

UNION OIL COMPANY OF CALIFORNIA

By *John Hansen* FORM APPROVED *AM*  
Attorney-in-Fact

STATE OF TEXAS     |  
                                  ss  
COUNTY OF MIDLAND |

The foregoing instrument was acknowledged before me this 26<sup>th</sup> day of June, 1964, by A. N. McDowell, Agent and Attorney-in-Fact of Tenneco Oil Company, a Delaware corporation, on behalf of said corporation.

*Sue Koen*  
Notary Public

My commission expires June 1, 1965.



STATE OF Texas     |  
                                  ss  
COUNTY OF Midland |

The foregoing instrument was acknowledged before me this 2nd day of July, 1964, by *John Hansen*, Attorney-in-Fact of Union Oil Company of California, a California corporation, on behalf of said corporation.

*Elma H. Sloan* **ELMA H. SLOAN**  
Notary Public

My commission expires June 1, 1965.





MAIN OFFICE 000

STATE OF NEW MEXICO JUL 9 AM 7:46

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS  
STATE ENGINEER

July 8, 1964

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

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

Dear Mr. Porter:

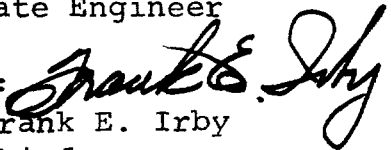
Reference is made to the application of Union Oil Company of California dated June 25, 1964 (rec'd. July 7, 1964) which seeks your approval to convert the following two wells to water injection service:

1. Tract 3-A, Well 5-3 located in the SW $\frac{1}{4}$  of NW $\frac{1}{4}$ , Sec. 3, T. 15 S., R. 31 E., N.M.P.M.
2. Tract 2, Well 9-4 located in the NE $\frac{1}{4}$  SE $\frac{1}{4}$ , Sec. 4, T. 15 S., R. 31 E., N.M.P.M.

Review of the application and exhibits III and IV indicate that no threat of contamination to the fresh waters which may exist in the area is likely to occur. Therefore, this office offers no objection to the granting of the application provided the plan set forth in the application and exhibits is not changed.

Yours truly,

S. E. Reynolds  
State Engineer

By:   
Frank E. Irby  
Chief  
Water Rights Div.

FEI/ma  
cc-Union Oil Co.  
F. H. Hennighausen

LARGE FORMAT  
EXHIBIT HAS  
BEEN REMOVED  
AND IS LOCATED  
IN THE NEXT FILE