

CASE 4618: Application of TENNECO  
FOR A WATERFLOOD PROJECT, LEA  
COUNTY, NEW MEXICO.

Case Number

4618

Application

Transcripts

Small Exhibits

ETC.

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

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

November 10, 1971  
Examiner Hearing

-----  
IN THE MATTER OF: )

Application of Tenneco Oil )  
Company for a unit agreement, )  
Lea County, New Mexico. )

Case No. 4617

and )

Application of Tenneco Oil )  
Company for a waterflood )  
project, Lea County, New )  
Mexico. )

Case No. 4618

-----  
BEFORE: DANIEL S. NUTTER, EXAMINER

TRANSCRIPT OF HEARING

## NEW MEXICO OIL CONSERVATION COMMISSION

## EXAMINER HEARING

SANTA FE, \_\_\_\_\_, NEW MEXICO

Hearing Date NOVEMBER 10, 1971TIME: 9 A.M.

NAME	REPRESENTING	LOCATION
J. M. Welock	Northern Natural Gas Co.	Hobbs, New Mexico
Luther C. Azbill	Skelly Oil Co.	Elmwood, N. Mex.
V. T. Lyon	Continental Oil Co.	Hobbs
James E. Hunter	John Mannon.	Overton
John E. Casey	Jake L. Mannon	Midland, Tex.
Borles Kelly	White Rock Kelly & Mc	SF
Walter V. Palmer	Tenneco Oil	Midland TX
Nina S. Dabanne	PW Byrum & Co.	SF
John Hendrix	John Hendrix	Midland, Tex.
W. D. Hendrix	Calgon Oil Co.	Midland, Tex.
Michael L. Klein	MKA Oil Corporation	Midland, Tex.
Don D. Jimmy	Jimmy, Christy & Cuyler	Koswell
S. H. Kanner	El Paso Natural Gas Co.	El Paso.

1 MR. NUTTER: The hearing will come to order please.  
2 The first case this morning will be Case No. 4617.

3 MR. HATCH: Case 4617. Application of Tenneco Oil  
4 Company for a unit agreement, Lea County, New Mexico.

5 I believe the Applicant has asked to consolidate the  
6 two for purposes of testimony.

7 MR. NUTTER: We will call also Case 4618.

8 MR. HATCH: Case 4618. Application of Tenneco Oil  
9 Company for a waterflood project, Lea County, New Mexico.

10 MR. KELLY: Booker Kelly of White, Gilbert, Koch,  
11 Kelly and McCarthy on behalf of the applicant. I have one  
12 witness and ask that he be sworn.

13 (Witness sworn)

14 MR. KELLY: Mr. Nutter, I have furnished a book which  
15 has all of the exhibits. The only addition is the log and the  
16 unit agreement.

17 MR. NUTTER: Okay. Fine.

18 WALTER PALMER  
19 having been first duly sworn, according to law, upon his oath  
20 testified as follows:

21 DIRECT EXAMINATION

22 BY MR. KELLY:

23 Q Mr. Palmer, would you state your full name, your address  
24 and employer?

25 A Walter Palmer, Box 1031, Midland, Texas. I am employed by

1       Tenneco Oil Company.

2   Q     And in what capacity?

3   A     Petroleum engineer.

4   Q     Have you previously qualified as an expert witness in the  
5       field of petroleum engineering before this Commission?

6   A     I have.

7               MR. KELLY: Are the witness' qualifications a matter  
8   of record?

9               MR. NUTTER: Yes, they are.

10  Q     What does Tenneco seek by these two applications?

11  A     Tenneco desires to unitize the Lusk-Seven Rivers field for  
12       purposes of secondary recovery by waterflood.

13  Q     Now, addressing ourselves initially to the application for  
14       unit agreement, and referring to the plat which has been  
15       marked Exhibit No. 1, would you define the proposed unit  
16       and recovery project?

17  A     The proposed unit is located in Lea County, New Mexico.  
18       Its name is the Lusk-Seven Rivers field, and we propose to  
19       unitize that portion of Section 3 specifically described  
20       in the unit agreement on page 2 as the west half, southeast  
21       quarter and the southwest quarter of the northeast quarter  
22       of Section 3, Township 19 South, Range 32 East.

23  Q     Now, what has been marked as Exhibit 2 is the final copy  
24       of the unit agreement; is that correct?

25  A     That's correct.

1 Q And in the application in the description of the overriding  
2 royalty interest there was an error. Could you explain  
3 that to the Commission?

4 A It was a typographical error. We have two tracts, the  
5 U.S.G.S. asked us to change the tract numbers, and in doing  
6 so we neglected to reverse the overriding royalty owners,  
7 so the overriding royalty ownership shown on the previously  
8 submitted unit agreement will be reversed.

9 It is correct in the one that you submitted today,  
10 but the previous one that you submitted, it is incorrect.

11 Q Exhibit 2 is correct?

12 A Exhibit 2 as submitted today has been corrected.

13 Q All right. Now, what zone or zones will be unitized in  
14 this agreement?

15 A The Lusk-Seven Rivers zone, zoned at about 3850 feet.

16 Q And this is for secondary recovery?

17 A For secondary recovery.

18 Q Now, Tenneco is the operator, and are there any other  
19 working interest owners?

20 A One other working interest owner, Jack McClellan.

21 Q And, of course, he is a party to this agreement?

22 A That's right.

23 Q And this is all on federal land?

24 A It is all federal land.

25 Q And what is your status with the U.S.G.S.?

1 A The U.S.G.S. has given their preliminary approval for the  
2 unit agreement, and we are waiting to hear from Shell to  
3 receive -- which is one of the overriding royalty owners,  
4 and when we hear from them U.S.G.S. will give us final  
5 agreement.

6 Q Now, what is the status of your sign-up of your override?

7 A Everybody in Tract 2 has signed, and Tract 1. Shell has  
8 not signed, and the other two small overriding royalty  
9 owners, we were unable to locate.

10 Q Do you expect any problem with getting Shell to sign up?

11 A No, sir.

12 Q Now, is the Exhibit No. 2 your proposed unit agreement a  
13 standard A.P.I. unit with the normal changes that the  
14 U.S.G.S. requires?

15 A Yes, it is.

16 Q It is similar to other unit agreements that have been  
17 approved by this Commission?

18 A Yes.

19 Q Now, going on to the second phase of the application for  
20 the secondary recovery project, again, Exhibit 1 defines  
21 the outline of the secondary recovery project and shows  
22 all of the wells and all of the offset operators in the  
23 area; is that correct?

24 A That's correct.

25 Q And are you unitizing the whole Seven Rivers field?



- 1 A Yes. Our six wells in that field, and they are all  
2 contained within the unit boundary.
- 3 Q So the proposed secondary recovery project will have your  
4 five producers and one injection well?
- 5 A That's correct.
- 6 Q Now, I understand that as a part of this application you  
7 are requesting that the order provide for expansion, either  
8 by additional injection wells or additional production  
9 wells prior to response; is that correct?
- 10 A That's correct, if required.
- 11 Q All right. Exhibit No. 3 is a structure map. Do you have  
12 anything you want to add to that?
- 13 A No. I believe that is self-explanatory.
- 14 Q Go on to Exhibit No. 4, your field data.
- 15 A I believe that is also self-explanatory, and it is a  
16 description of the reservoir mechanism, and the porosity  
17 and other reservoir data pertinent to the field.
- 18 Q Exhibit No. 5 is a three-page exhibit that shows the  
19 production history over the life of the field; is that  
20 correct?
- 21 A That's correct.
- 22 Q And you have put in the total production figures at page  
23 3 of that exhibit. What is your average daily production,  
24 now, on these five producers?
- 25 A Average daily production is about 50 barrels a day or 5

1 barrels per well per day average.

2 Q Now, in your opinion are these wells close to their

3 economic limit?

4 A Yes. The economic limit is around 2 barrels a day. They

5 are presently at 5.

6 Q What does Tenneco expect as far as the recovery on

7 secondary recovery?

8 A We are anticipating about a half a barrel of secondary

9 oil per barrel.

10 Q Now, Exhibit No. 6 is a decline curve showing the rate of

11 decline, tabulation, basically the same as Exhibit 5; is

12 that correct?

13 A That's correct. That is a plot of the tabulated data.

14 Q And Exhibit No. 7 is your diagrammatic sketch of the

15 proposed injection well. What is the present status of

16 that well?

17 A That well is now a producer.

18 Q Would you explain the installation that you propose?

19 A We intend to install on two and three-eighths inch tubing

20 a tension packer at approximately 3740 feet which is about

21 100 feet or plus or minus above the existing perforations

22 which are from 3840 to 3848, referring to the schematic

23 diagram.

24 We will inject fresh water down the tubing and load

25 the annulus with corrosion-inhibited fluid, monitor the

- 1 surface tubing annulus with a pressure gauge.
- 2 Q Now, is there any other production zones up structure here?
- 3 A No, sir, there is not.
- 4 Q And do you feel that the casing program would prevent
- 5 migration of fluid to other zones, either fresh water
- 6 surface zones or any other zones?
- 7 A Yes. The surface casing is cemented to the surface at
- 8 325 feet.
- 9 Q Now, what will you be injecting in this well?
- 10 A Fresh water.
- 11 Q And you don't anticipate to have any corrosion problems?
- 12 A No. We don't usually have any corrosion problems with
- 13 fresh water in this area.
- 14 Q What do you think will be the life of this project if
- 15 successful?
- 16 A Oh, approximately five to seven years.
- 17 Q What is your expected injection pressures here?
- 18 A Oh, 500 pounds to 1000 pounds at the surface.
- 19 Q And the volumes of injection?
- 20 A Oh, we expect 800 to 1000 barrels a day.
- 21 Q That would be fairly constant as far as you know?
- 22 A I believe so.
- 23 Q And Exhibit 8 is the log of the well? Do you have anything
- 24 you want to point out on the log?
- 25 A No, I don't believe so. The existing perforations are

1 shown opposite the Seven Rivers formation on the density  
2 log of that well.

3 Q In your opinion would the granting of these applications  
4 protect the correlative rights of all parties and prevent  
5 waste?

6 A Yes, it would.

7 Q Lead to the production of oil and gas that would otherwise  
8 be left in place?

9 A That's correct.

10 Q Were Exhibits 1 through 8 prepared by you or under your  
11 supervision?

12 A They were.

13 MR. KELLY: We would at this time move the introduction  
14 of Exhibits 1 through 8 in both of these cases.

15 MR. NUTTER: Applicant's Exhibits 1 through 8 will be  
16 admitted in Cases 4617 and 18.

17 MR. KELLY: That's all we have on direct, Mr. Examiner.

18 CROSS-EXAMINATION

19 BY MR. NUTTER:

20 Q Mr. Palmer, apparently from Exhibit No. 5 here you have had  
21 a total accumulative production of about 200,000 barrels  
22 from these wells; is that correct?

23 A That's correct.

24 Q So you anticipate maybe another 100,000?

25 A Another 100,000. I hope we could do better.

1 Q All right, sir. This does constitute the entire field --

2 A Yes, sir.

3 Q -- being flooded?

4 A Yes, sir.

5 Q Now, you mentioned that you would be injecting fresh water.

6 I presume at the time that you start producing water from

7 the wells that you recycle the produced water also; is

8 this true?

9 A Yes, sir.

10 Q And the annulus of the well, of the injection well, then,

11 would be loaded with corrosion-inhibited fluid and equipped

12 with a gauge at the surface?

13 A That's correct.

14 MR. NUTTER: Are there any further questions of Mr.

15 Palmer? He may be excused.

16 (Witness excused)

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

18 MR. KELLY: Nothing further.

19 MR. NUTTER: Does anyone have anything to offer in

20 Case 4617 or 4618?

21 Take the case under advisement.

22

23

24

25

I N D E X

<u>WITNESS</u>	<u>PAGE</u>
WALTER PALMER	
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1 STATE OF NEW MEXICO )  
2 )  
3 COUNTY OF BERNALILLO )

4 I, LINDA MALONE, Court Reporter, do hereby certify that  
5 the foregoing and attached Transcript of Hearing before the  
6 New Mexico Oil Conservation Commission was reported by me;  
7 that the same is a true and correct record of the said  
8 proceedings, to the best of my knowledge, skill and ability.  
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*Linda Malone*  
Court Reporter

I do hereby certify that the foregoing is  
a complete record of the proceedings in  
the Bernalillo hearing of Case No. 7617-4618  
heard by me on 11/10 19 71.

*[Signature]*  
Examiner  
New Mexico Oil Conservation Commission

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

November 16, 1971

Mr. Booker Kelly  
White, Gilbert, Koch & Kelly  
Attorneys at Law  
Post Office Box 787  
Santa Fe, New Mexico

Dear Mr. Kelly:

Enclosed herewith is Commission Order No. R-4222, entered in Case No. 4618, approving the Tenneco Lusk Seven Rivers Waterflood Project.

Initial injection is to be through the one authorized water injection well, which shall be equipped with tubing set in a packer approximately 100 feet above the uppermost perforation. The casing-tubing annulus shall be loaded with a corrosion-inhibited fluid and equipped with a pressure gauge at the surface.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 252 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less.

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

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



OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

-2-

Mr. Booker Kelly  
White, Gilbert, Koch & Kelly  
Attorneys at Law  
Santa Fe, New Mexico

November 16, 1971

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

O

Very truly yours,

P

A. L. PORTER, Jr.  
Secretary-Director

ALP/DSN/ir

Y

Enclosure

cc: Oil Conservation Commission  
Hobbs, New Mexico

United States Geological Survey  
Post Office Box 1838  
Hobbs, New Mexico 88240

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

**BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO**

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

**CASE NO. 4618  
Order No. R-4222**

**APPLICATION OF TENNECO OIL  
COMPANY FOR A WATERFLOOD PROJECT,  
LEA COUNTY, NEW MEXICO.**

**ORDER OF THE COMMISSION**

**BY THE COMMISSION:**

This cause came on for hearing at 9 a.m. on November 10, 1971, at Santa Fe, New Mexico, before Examiner Daniel S. Mutter.

NOW, on this 16th day of November, 1971, 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, Tenneco Oil Company, seeks authority to institute a waterflood project in the Lusk (Seven Rivers) Unit Area, Lusk-Seven Rivers Pool, by the injection of water into the Seven Rivers formation through its Shell Federal Well No. 1 located in Unit F of Section 3, Township 19 South, Range 32 East, NMPM, Lea County, New Mexico.

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

CASE NO. 4618  
Order No. R-4222

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

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

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

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to institute a waterflood project in the Lusk (Seven Rivers) Unit Area, Lusk-Seven Rivers Pool, by the injection of water into the Seven Rivers formation through its Shell Federal Well No. 2 located in Unit F of Section 3 of Township 19 South, Range 32 East, NMPM, Lea County, New Mexico.

(2) That the subject waterflood project is hereby designated the Tenneco Lusk Seven Rivers Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

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

(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.

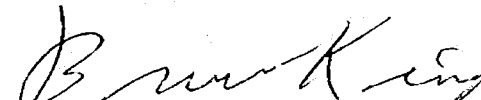
-3-

CASE NO. 4618  
Order No. R-4222

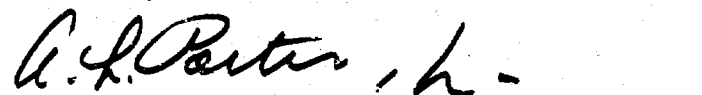
(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

  
BRUCE KING, Chairman

  
ALEX J. ARMIJO, Member

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

SEAL

dr/

DOCKET: EXAMINER HEARING - WEDNESDAY - NOVEMBER 10, 1971

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 4617: Application of Tenneco Oil Company for a unit agreement, Lea  
County, New Mexico. Applicant, in the above-styled cause,  
seeks approval of a unit area comprising 520 acres, more or  
less, of Federal lands in Section 3, Township 19 South,  
Range 32 East, Lusk-Seven Rivers Pool, Lea County, New  
Mexico.

CASE 4618: Application of Tenneco Oil Company for a waterflood project,  
Lea County, New Mexico. Applicant, in the above-styled  
cause, seeks authority to institute a waterflood project  
in the Lusk-Seven Rivers Pool by the injection of water  
through one well located in the SE/4 NW/4 of Section 3,  
Township 19 South, Range 32 East, Lea County, New Mexico.

CASE 4619: Application of Corinne Grace for compulsory pooling, Eddy  
County, New Mexico. Applicant, in the above-styled cause,  
seeks an order pooling all mineral interests from the  
surface of the ground down to and including the Morrow  
formation underlying the N/2 of Section 25, Township 22  
South, Range 26 East, which acreage is within one mile of  
the South Carlsbad-Morrow Gas Pool, Eddy County, New Mexico.  
Said acreage to be dedicated to a well to be drilled to the  
Morrow formation at a location 1980 feet from the North  
and East lines of said Section 25. Also to be considered  
will be the costs of drilling said well, a charge for the  
risk involved, a provision for the allocation of actual  
operating costs, and the establishment of charges of super-  
vision of said well.

CASE 4620: Application of Corinne Grace for compulsory pooling, Eddy  
County, New Mexico. Applicant, in the above-styled cause,  
seeks an order pooling all mineral interests from the  
surface of the ground down to and including the Morrow  
formation underlying the N/2 of Section 24, Township 22  
South, Range 26 East, which acreage is in the vicinity of  
the South Carlsbad-Morrow Gas Pool, Eddy County, New Mexico.  
Said acreage to be dedicated to a well to be drilled to  
the Morrow formation at a location 1980 feet from the North  
and East lines of said Section 24. Also to be considered  
will be the costs of drilling said well, a charge for the  
risk involved, a provision for the allocation of actual  
operating costs, and the establishment of charges for super-  
vision of said well.

CASE 4563: Continued from the October 27, 1971, Examiner Hearing

Application of Corinne Grace for special gas-oil ratio limitation and pressure maintenance project, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to produce her State Well No. 1 located in Unit A of Section 1, Township 15 South, Range 29 East, Double L-Queen Pool, Chaves County, New Mexico, with no gas-oil ratio limitation, strip the liquids, and institute a pressure maintenance project by the injection of all said gas back into the producing formation through her State Well No. 2 located in Unit B of said Section 1. Applicant further seeks to transfer an oil allowable from said Well No. 2 to said Well No. 1.

CASE 4621: Application of Jack L. McClellan for a dual completion, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of his Bar-J Federal Well No. 1 located in Unit E of Section 15, Township 6 South, Range 27 East, Chaves County, New Mexico, in such a manner as to produce oil from an undesignated Siluro-Devonian pool through tubing and gas from the Haystack-Cisco Gas Pool through the casing-tubing annulus.

CASE 4622: Application of Jake L. Hamon for a non-standard unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of an 80-acre non-standard oil proration unit comprising the NE/4 SE/4 and SE/4 NE/4 of Section 30, Township 16 South, Range 36 East, East Shoe Bar-Devonian Pool, Lea County, New Mexico, to be dedicated to a well to be drilled 1830 feet from the South line and 660 feet from the East line of said Section 30.

CASE 4623: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the amendment of the definition of a gas well as it appears in its Rules and Regulations to read as follows:

"Gas well shall mean a well producing gas or natural gas from a gas pool or a well with a gas-oil ratio in excess of 100,000 cubic feet of gas per barrel of oil producing from an oil pool."



EXHIBIT

LUSK SEVEN RIVERS FIELD DATA

Name of Reservoir	Seven Rivers
Average Depth at Pay	3850'
Pay thickness	4 - 8 feet
Field structure	Stratigraphic Trap
Producing Mechanism	Solution gas drive
Original oil in place	2,640,000 STBO
.	
Average porosity	19.6%
Estimated water saturation	30%
Oil Gravity	37°API
Reservoir Temperature	105°F
Reservoir Pressure (original)	1500 psia
Current production 6-71	
Oil	671 bbls. oil
Gas	1887 MCF
Water	67 bbls. water
Water cut	9%
Number of producing oil wells	6
Depth Allowable Factor	1
Current Top Allowable per well	75 BOPD
Current Field Allowable 11/71	48 BOPD
Cumulative Oil Production 1-1-71	182,390 bbls.

BEFORE EXAMINER NUTTER  
OIL CONSERVATION COMMISSION  
*Applicant* EXHIBIT NO. 4  
CASE NO. 4617-18



LUSK SEVEN RIVERS  
TOTAL FIELD

	<u>OIL</u> <u>BBLS.</u>	<u>MCF</u> <u>GAS</u>	<u>CF/BBL.</u> <u>GOR</u>
<u>1965</u>			
Jan.			
Feb.			
Mar.	628	-	-
Apr.	1139	-	-
May	2301	-	-
June	2285	-	-
July	2255	-	-
Aug.	2345	-	-
Sept.	3065	1892	617
Oct.	3601	1019	283
Nov.	3542	1044	295
Dec.	3765	1355	360
	(24926)	(5310)	
<u>1966</u>			
Jan.	5581	3262	567
Feb.	7521	3013	400
Mar.	8107	7396	912
Apr.	7424	8334	1122
May	6269	8321	1327
June	4798	7055	1471
July	4183	7215	1727
Aug.	4232	6930	1640
Sept.	3573	5251	1470
Oct.	3143	4600	1463
Nov.	2935	3885	1326
Dec.	2795	3711	1327
	(60412)	(68879)	(1140)
<u>1967</u>			
Jan.	2253	2175	966
Feb.	1968	1796	913
Mar.	2192	2788	1273
Apr.	1890	2566	1360
May	2124	2284	1077
June	3845	2148	560
July	3323	3957	1191
Aug.	3193	4503	1410
Sept.	2484	3550	1428
Oct.	2480	3733	1503
Nov.	2218	2641	1190
Dec.	2172	1284	592
	(30142)	(33425)	(1109)

*Page 1*  
*E45*

Lusk Seven Rivers (Cont'd)  
Total Field

Page 2

	<u>OIL DBLS.</u>	<u>MCF GAS</u>	<u>CF/DBL. GOR</u>
<u>1968</u>			
Jan.	2696	2421	898
Feb.	3212	3314	1032
Mar.	3391	4508	1330
Apr.	2538	3655	1443
May	2556	4172	1621
June	2520	4222	1695
July	2908	5089	1750
Aug.	2441	4579	1875
Sept.	2090	3448	1641
Oct.	1850	3456	1867
Nov.	1852	3218	1740
Dec.	<u>1638</u>	<u>2285</u>	1395
	(29692)	(43971)	(1481)
<u>1969</u>			
Jan.	1806	3378	1318
Feb.	1461	2865	1962
Mar.	1477	2935	1988
Apr.	1799	3244	1801
May	1620	3211	1963
June	1625	1581	973
July	1743	2582	1480
Aug.	1659	3105	1869
Sept.	1686	2763	1640
Oct.	1618	2726	1685
Nov.	1421	2509	1766
Dec.	<u>1692</u>	<u>2242</u>	1325
	(19607)	(33072)	(1687)
<u>1970</u>			
Jan.	1611	2005	1245
Feb.	1461	2205	1509
Mar.	1442	2291	1589
Apr.	1399	2390	1708
May	1336	2283	1709
June	1525	2830	1856
July	1602	2940	1835
Aug.	1356	2775	2046
Sept.	1351	2749	2035
Oct.	1599	2733	1709
Nov.	1530	2479	1120
Dec.	<u>1399</u>	<u>2501</u>	38
	(17611)	(30181)	(1714)
Cumulative	182390	214838	1178

FIG. NO. 11  
(Cont'd)

LUSK SEVEN RIVERS  
TOTAL FIELD

	<u>OIL</u> <u>BBLs.</u>	<u>MCF</u> <u>GAS</u>	<u>CF/BBL.</u> <u>GOR</u>
<u>1971</u>			
Jan.	1346	1502	1120
Feb.	1123	2136	1900
Mar.	1270	2577	2020
Apr.	1104	2309	2100
May	1074	2303	2140
June	671	1887	3560
July	916	1772	1935
Aug.	826	1738	2104
Sept.	882	1400	1587
<u>TOTAL</u>	<u>191602</u>	<u>232462</u>	

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION

Applicants EXHIBIT NO. 5

CASE NO. 4617-18

P 3  
2x5

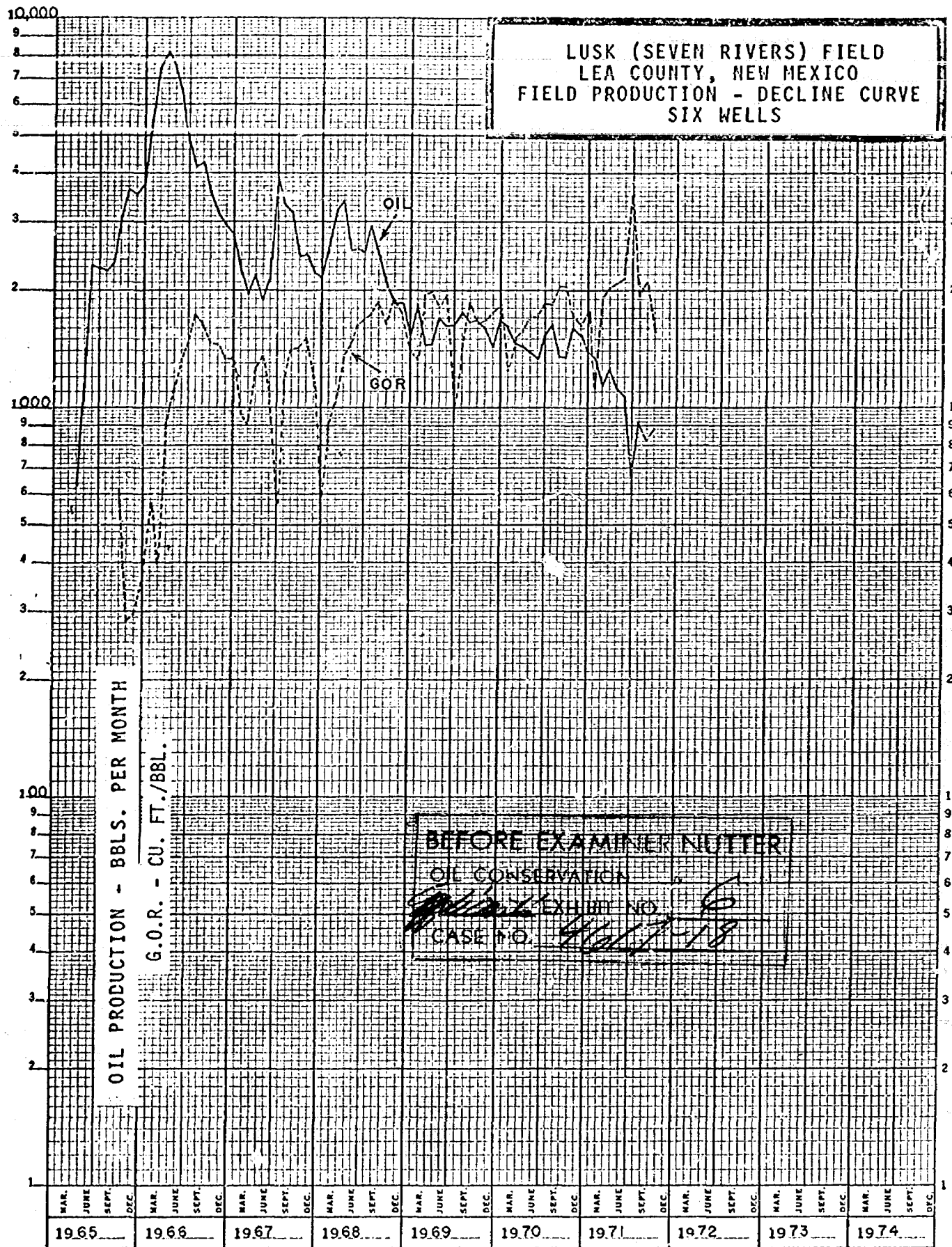
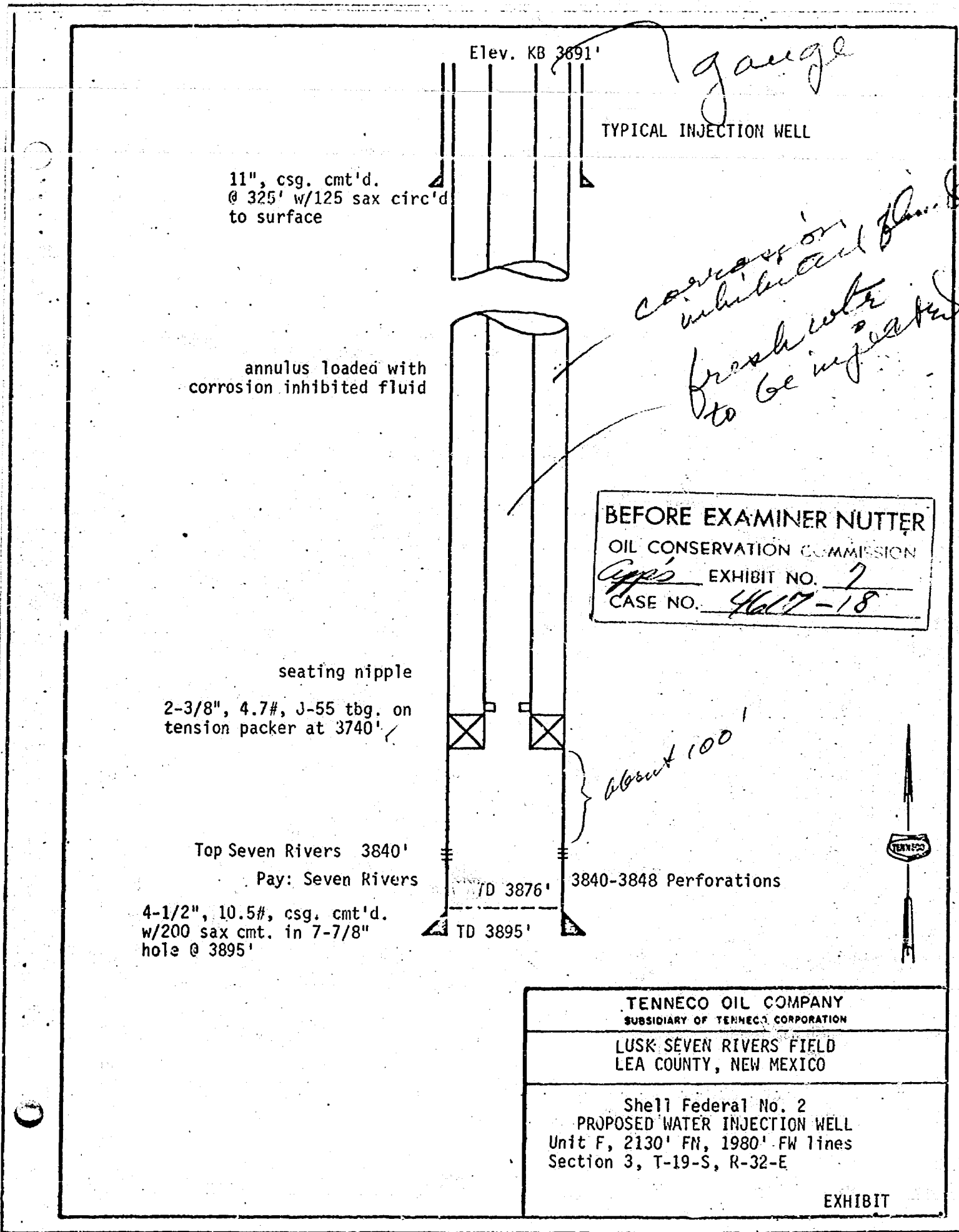
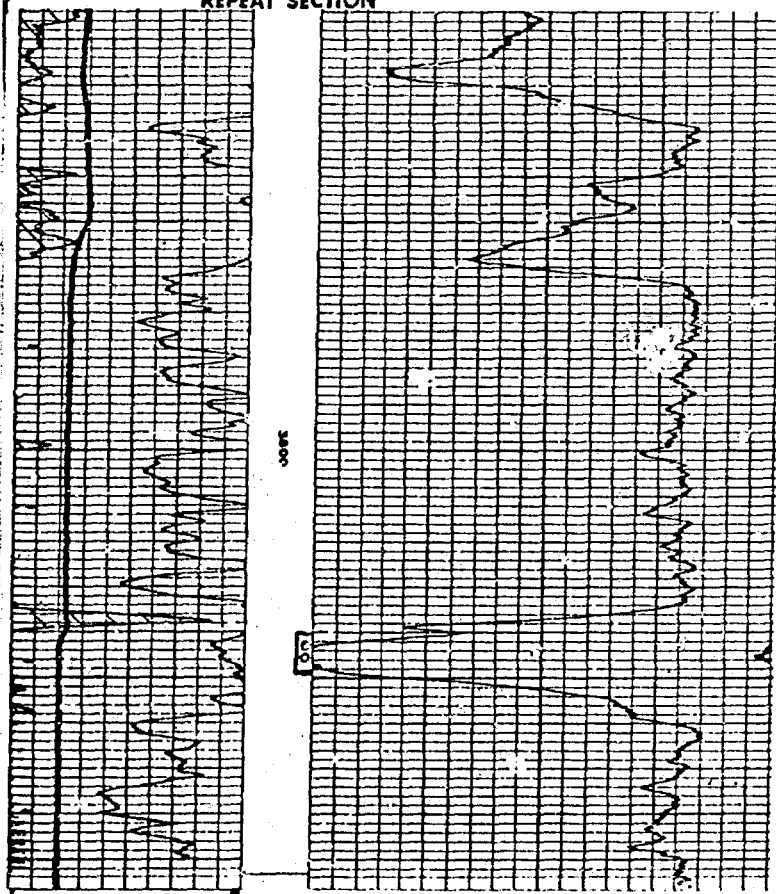


FIG. NO. 14



7 9 11 13 15 HOLE SIZE - INCHES 10 API/CO 0 API 100 API RADIATION INTENSITY INCREASES		2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 DENSITY IN GM/CM <sup>3</sup> 50,000 CPM 2000 CPM/CO 20,000 CPM	
GAMMA RAY & CALIPER		DEPTH	DENSITY
Company CACTUS DRILLING COMPANY Well SHELL FEDERAL NO. 2 Field WILCAT (QUEEN) County LEA State NEW MEXICO		Drillers T.D. 3895' Lone-Wells F.R. 3893' Lone-Wells T.D. 3895' Elevations: K.B. 3691' D.F. 3690' G.L. 3678.8'	

REPEAT SECTION



EX 8

Examiner Henry - Nov. 10, 1971

Newspaper

Case —

Application of Tennessee Oil Company for  
a waterflood project, Lea County, New  
Mexico.

Applicant, in the above-styled case,  
seeks authority to institute a waterflood  
project in the Bush-Sherman River Pool by  
the injection of water through one well  
located in the SE/4 NW/4 of Section 3,  
Township 19 South, Range 32 East, Lea  
County, New Mexico.

ROUGH DRAFT FOR WATERFLOOD LETTERS

Mr. Booker Kelly  
White, Gilbert, Koch & Kelly  
Attorneys at Law  
Post Office Box 787  
Santa Fe, New Mexico

Dear Sir:

*Enclosed herewith* Commission Order No. R-4222, entered in Case No. 4618, approving the Tenneco Lusk Seven Rivers Waterflood Project.

*Initial injection is to be through the one authorized water injection well, which shall be equipped with tubing set in a packer approximately 100 feet above the uppermost perforation. The casing-tubing annulus shall be loaded with a corrosion-inhibited fluid and equipped with a pressure gauge at the surface.*

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 257 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less.

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

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

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

Very truly yours,

A. L. PORTER, Jr.  
Secretary-Director

cc: OCC: Hobbs x  
Artesia         
Aztec       

USGS Hobbs

~~Mr. Frank L. Gray~~, State Engineer Office, Santa Fe, New Mexico

Mr. D. E. Gray,



DRAFT

GMH/dr

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. 4618

Order No. R- 4222

APPLICATION OF TENNECO OIL COMPANY  
FOR A WATERFLOOD PROJECT, LEA COUNTY,  
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on Nov. 10, 1971,  
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this \_\_\_\_\_ day of November, 1971, 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, Tenneco Oil Company,  
seeks authority to institute a waterflood project in the Lusk  
(Seven Rivers) Unit Area, Lusk-Seven Rivers Pool,  
by the injection of water into the Seven Rivers formation  
its Shell Federal well No. 1 located in Unit F 8  
through one injection well in Section 3,  
Township 19 South XXXXXXX North, South, Range 32 XXXX East,  
NMPM, Lea County, New Mexico.

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

DRAFT

GMH/dr

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  
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ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on Nov. 10, 1971,  
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this \_\_\_\_\_ day of November, 1971, 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 the wells in the project area are in an advanced  
state of depletion and should properly be classified as "stripper"  
wells.

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

<sup>6</sup>  
(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; *provided however, that the showing of well response as required by Rule 701 E-5 should not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.*  
IT IS THEREFORE ORDERED: *well to water injection.*

(1) That the applicant, Tenneco Oil Company,  
is hereby authorized to institute a waterflood project in the  
Lusk (Seven Rivers) Unit Area, Lusk-Seven Rivers Pool,  
by the injection of water into the Seven Rivers formation  
*its Shell Federal Well No. 2 located in Unit F of Section 3 &*  
through ~~the following described wells in~~ Township 19  
~~NORTH~~, South, Range 32 ~~WEST~~, East, NMPM, Lea  
County, New Mexico.

(2) That the subject waterflood project is hereby designated  
the Tenneco Lusk Seven Rivers Waterflood Project and shall  
be governed by the provisions of Rules 701, 702, and 703 of the  
Commission Rules and Regulations.

PROVIDED HOWEVER, that the Secretary-Director of the  
Commission may approve expansion of the above-described water-  
flood project to include such additional injection wells in  
the area of said project as may be necessary to complete an  
efficient water injection pattern; that the showing of well  
response as required by Rule 701 E-5 shall not be necessary  
before obtaining administrative approval for the conversion of  
additional wells to water injection. *(under)*

<sup>6</sup>  
(8) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations; *provided however, that the showing of well response as required by Rule 701 E-5 should not be necessary before the Commission is allowed to approve the application in addition.*  
IT IS THEREFORE ORDERED: well to water injection.

(1) That the applicant, Tenneco Oil Company,  
is hereby authorized to institute a waterflood project in the  
Lusk (Seven Rivers) Unit Area, Lusk-Seven Rivers Pool,  
by the injection of water into the Seven Rivers formation  
in Shell Federal Well No. 2 located in Unit F 9 Section 3 8  
through ~~the following described wells in~~ Township 19  
~~North~~, South, Range 32 ~~West~~, East, NMPM, Lean  
County, New Mexico.

(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.