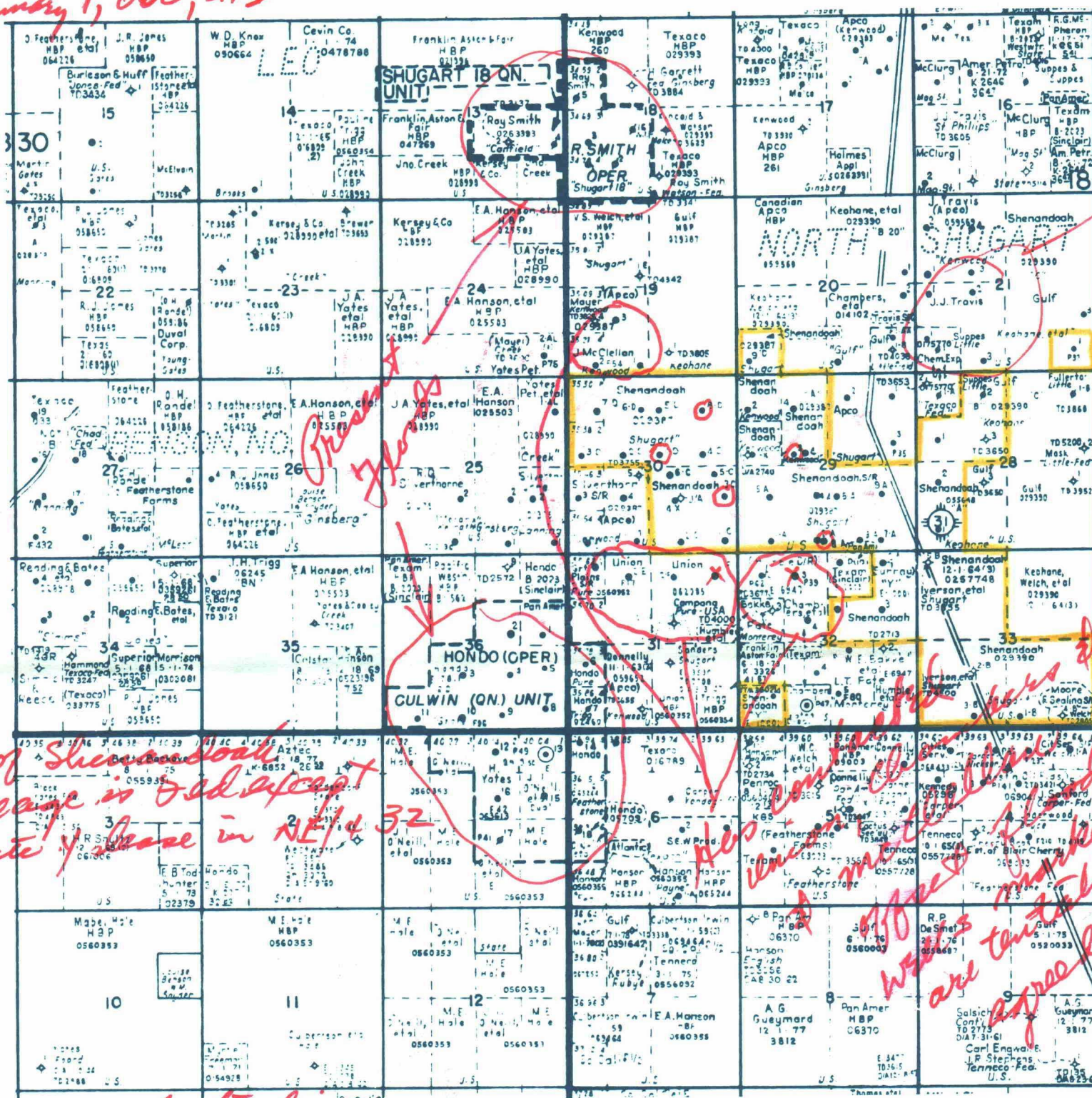


primary 1, 060, 219

J Featherstone HBP et al 064226	J.R. Jones HBP 050650	W.D. Knox HBP 090664
---------------------------------------	-----------------------------	----------------------------



Flood
Being
Planned

T
18
S

Kennedy

T
19
S

all of Shesha's boat
acres is Fed except
state of base in NE/4

[illegible]

Comd wtr line
crosses leave.

will my

ave daily prod
is 5 BOPD

Producing zones:

Yates
 Penrose
 middle } Grayburg
 Lower }

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Appl EXHIBIT NO. A
CASE NO. 3779

FLOOD 4
SHUGART
EDDY COUNTY, NEW MEXICO

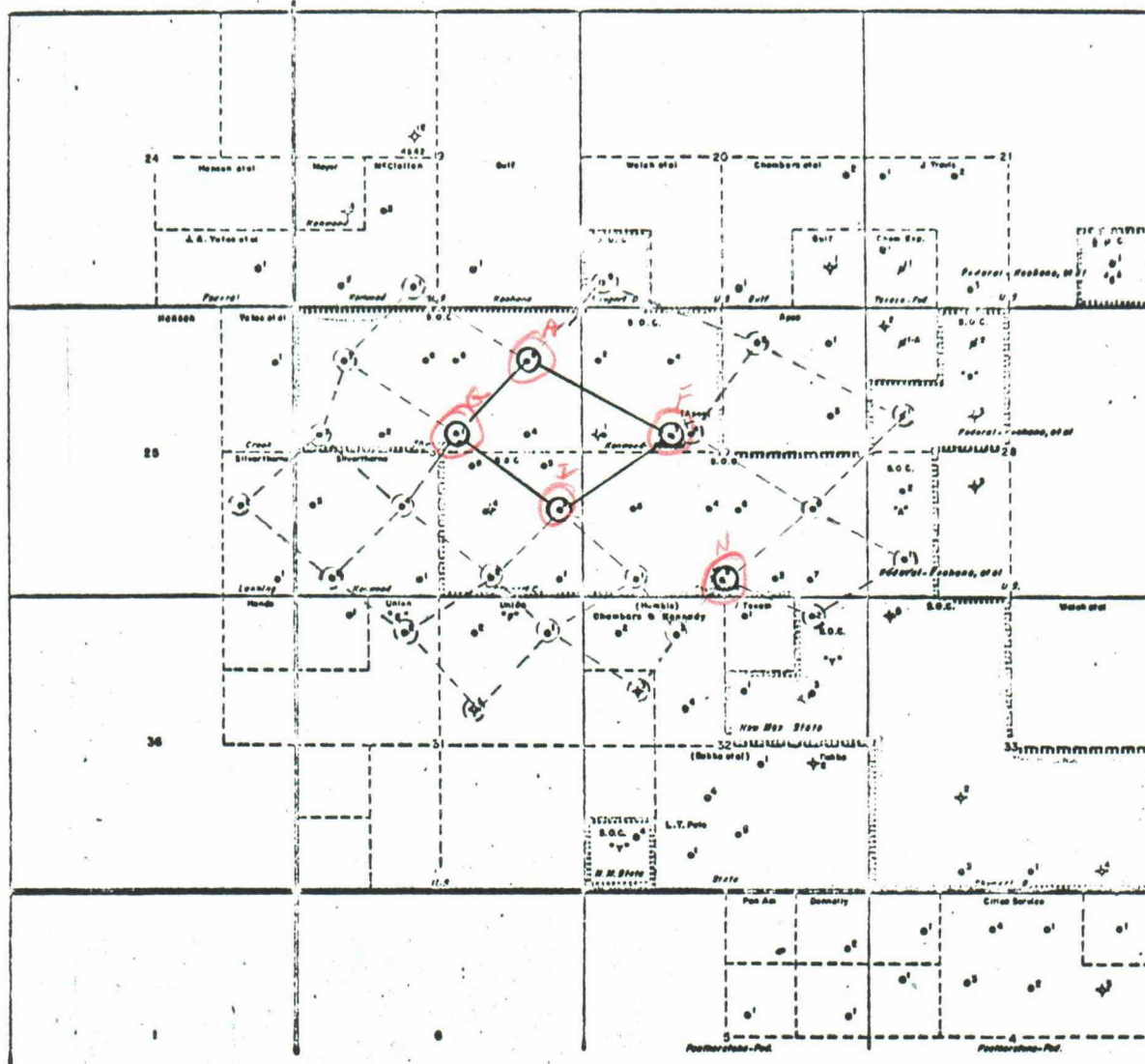
SCALE: 1" = 4000'

8 (yacs only) 350 BWP/D
multiple zone wells: 200 per day/zone
or 600 BWP/D

EXHIBIT "B"

R 30 E

R 31 E



T
18
S

-LEGEND-

----- LEASE BOUNDARIES

- Pilot
- Proposed Field Pattern
- ⊙ Converted Pilot Inj. Well
- ⊙ Proposed Conversion



SHENANDOAH OIL CORPORATION

FLOOD NO. 4
SHUGART
EDDY COUNTY, NEW MEXICO

SCALE
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DLPT 1047

Case 3779

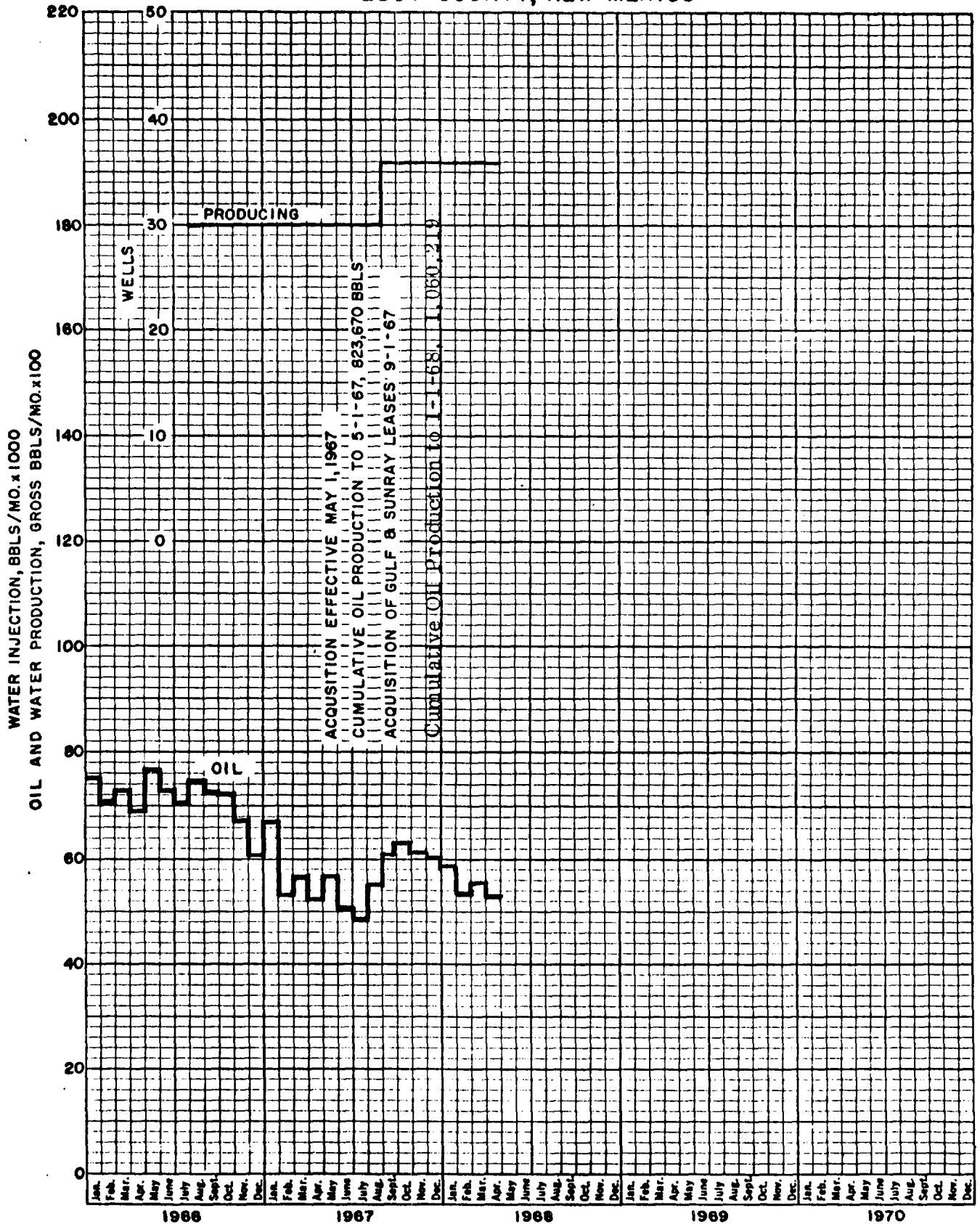
SHUGART A - 8	SHUGART D - 1	SHUGART D - 8	SHUGART C - 3	KENWOOD-FED.
27' - 8 5/8" Csg. Circ. w/10 Sks.	763' - 8 5/8" Csg. 110 Sks. Cement	755' - 8 5/8" Csg. 75 Sks. Cement	757' - 8 5/8" Csg. 75 Sks Cement	750' - 8 5/8" Csg. 50 Sks Cement
2692'-4 1/2" Csg. 250 Sks Cement Perf. 2590-2610'	3808'-5 1/2" Csg. 125 Sks. Cement Perf. 3387-3404 3620-3630 3761-3777	3835-5 1/2" Csg. 175 Sks Cement Per. 3418-3426 3466-3476 3760-3778	3751'-5 1/2" Csg. 100 Sks Cement Perf. 3640-3656	3895'-5 1/2" Csg. 150 Sks Cement Perf. 3774-3788 3799-3800
T.D. 2692' Note: Tension pkr will be set near shoe on plastic coated tbq.	T.D. 3808' Note: The 3 zones will be isolated by using Baker flow valve and pkr. arrangement w/1 string of 2"	T.D. 3850' Note: The 3 zones will be isolated w/Baker flow valves & pkrs. run w/ 1 string of 2" plastic coated Tbg.	T.D. 3804' Note: Panrose Sec will be perf. & will be dually compl. f/inj using Baker flow valve arrangement	T.D. 3895' Note: Rights from 3500' these two zones will be isolated using pkr & flow valve

Exhibit D

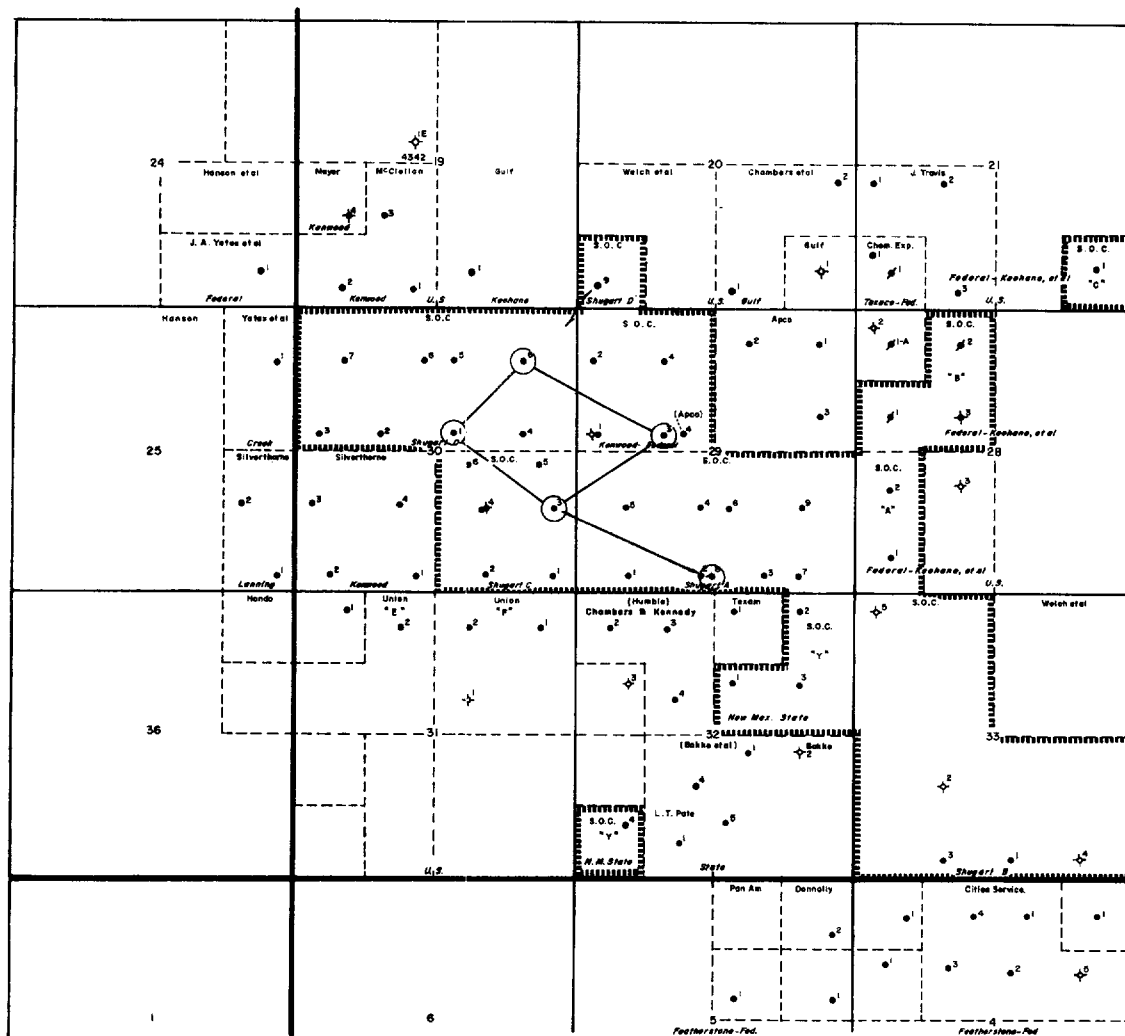
Lease and Well No.	Hole Size	Size and Depth of Casing	Sacks of Cement Used	Lin. Feet per Sack	Calculated Top of Cement
Shugart A-8	10" 6-1/4"	8-5/8" @ 27' 4-1/2" @ 2,692'	10 250	7.87 10.71	Circulated 16'
Shugart C-3	10" 7"	8-5/8" @ 757' 5-1/2" @ 3,751'	75 100	7.87 10.75	173" 2,676'
Shugart D-1	10" 7"	8-5/8" @ 763' 5-1/2" @ 3,808'	110 125	7.87 10.75	Circulated 2,465'
Shugart D-8	10" 7"	8-5/8" @ 755' 5-1/2" @ 3,835'	75 175	7.87 10.75	173' 1,954'
Kenwood Fed. 3	10" 7"	8-5/8" @ 750' 5-1/2" @ 3,895'	50 150	7.87 10.75	357' 2,283'

661-3-77

FLOOD NO. 4 SHUGART EDDY COUNTY, NEW MEXICO



R 31 E

T
18
S

***** LEASE BOUNDARIES

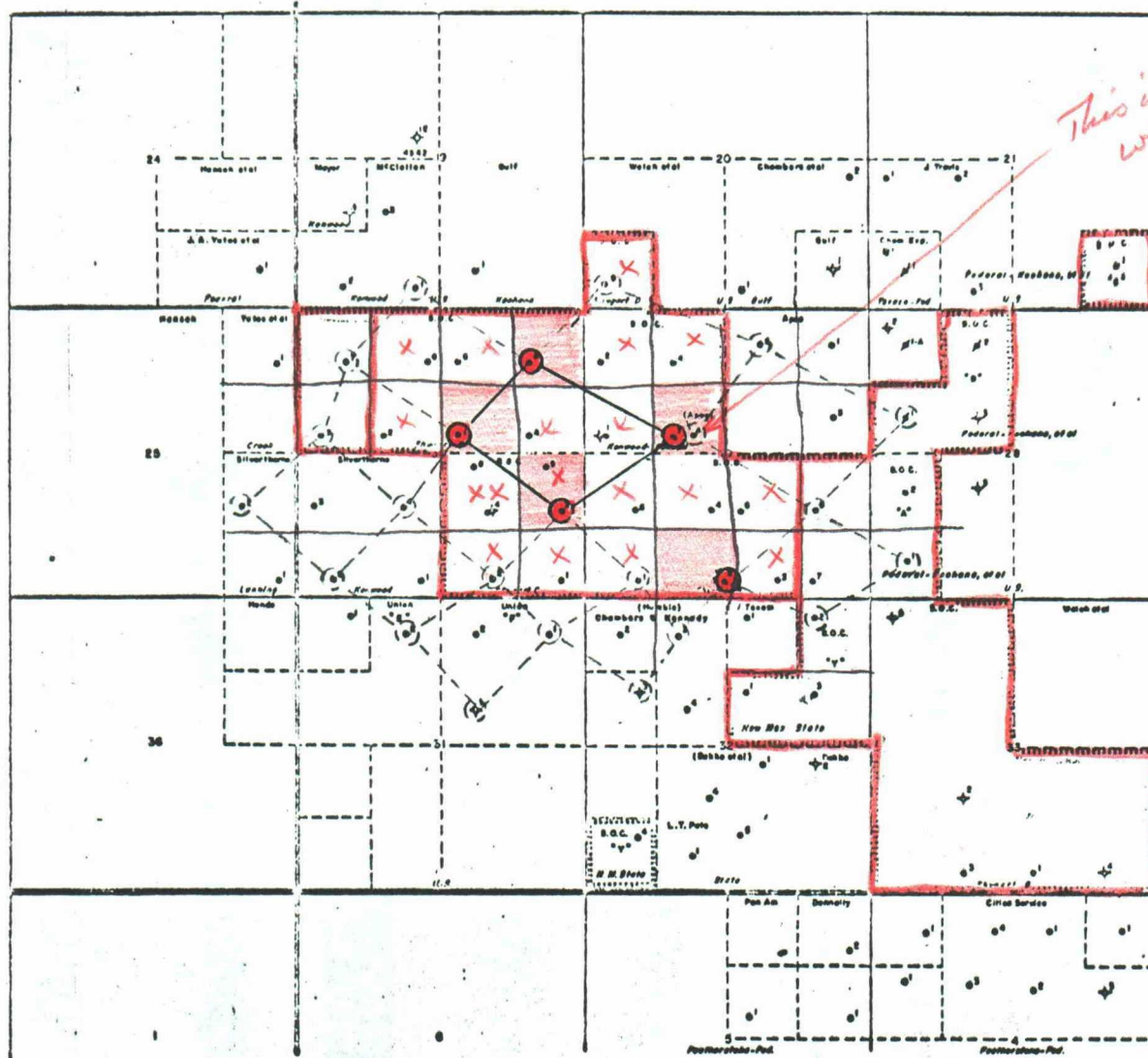
FLOOD NO. 4
SHUGART
EDDY COUNTY, NEW MEXICO

SCALE

0 1/2 1 MI.

JUNE, 1968

R 31 E



*This is an APO
well - not a
Shenandoah
well
is not an extra*

7
18
S

BEFORE EXAMINER: NUTTER
OIL CONSERVATION COMMISSION
Appl. EXHIBIT NO. B
CASE NO. 3779

-LEGEND-

***** LEASE BOUNDARIES

_____ Pilot
 ----- Proposed Field Pattern
 ⊙ Converted Pilot Inj. Well
 ⊙ Proposed Conversion

$$\begin{array}{r} 42 \\ 21 \\ \hline 42 \\ 84 \\ \hline 88.2 \\ 28 \\ \hline 910 \end{array}$$

5 inj 40's 1 extra
 16 prod 40's 1 extra

 21 40's 2 extras



SHENANDOAH OIL CORPORATION

FLOOD NO. 4
SHUGART
EDDY COUNTY, NEW MEXICO

SCALE

SEPT 1963

SHENANDOAH OIL CORPORATION
FORT WORTH, TEXAS

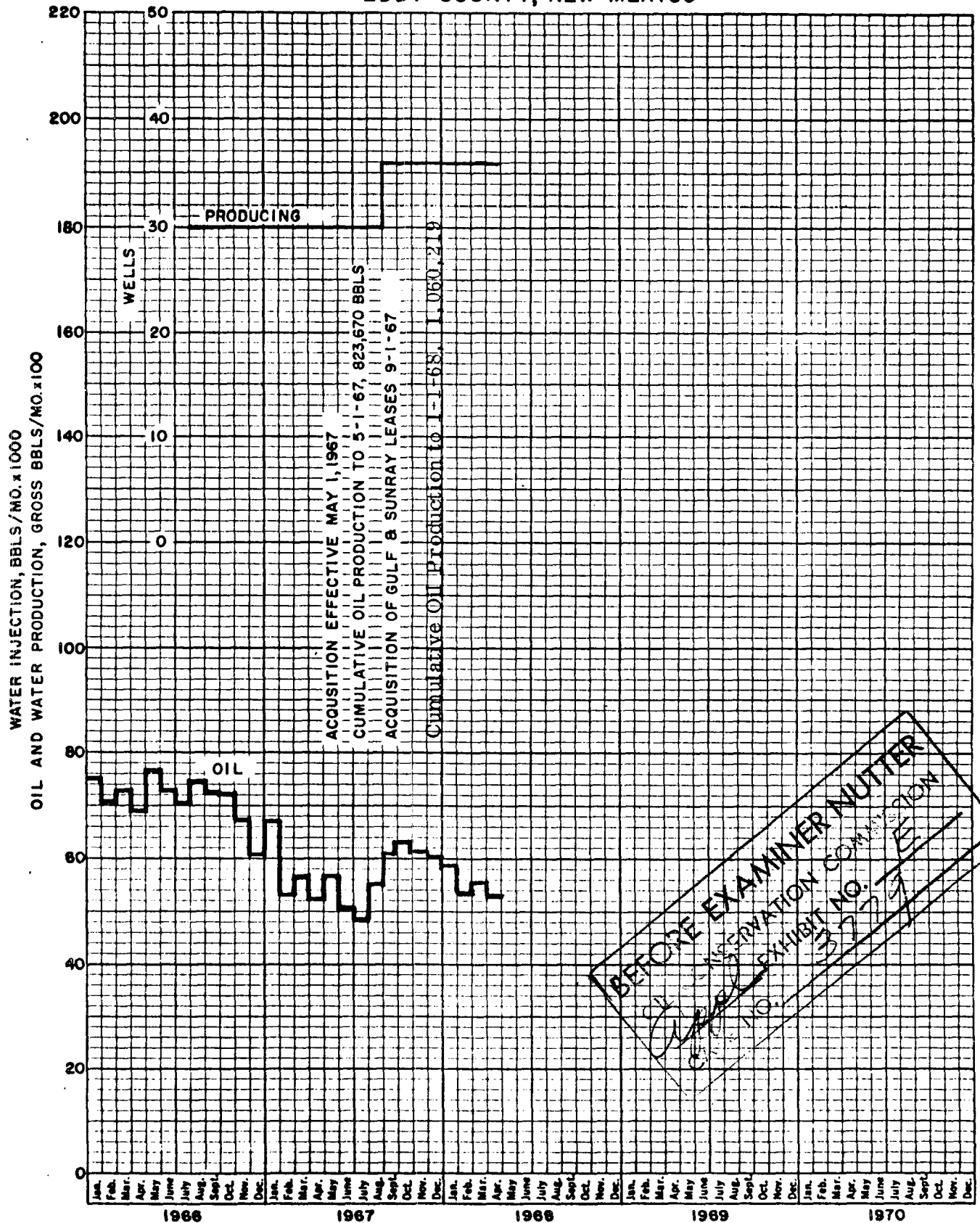
SHUGART A - 8	SHUGART D - 1	SHUGART D - 8	SHUGART C - 3	KENWOOD-FED.
27' - 8 5/8" Csg. Circ. w/10 Sks. <i>Calc top: circ</i>	763' - 8 5/8" Csg. 110 Sks. Cement <i>195'</i> <i>circ</i>	755' - 8 5/8" Csg. 75 Sks. Cement <i>173</i>	757' - 8 5/8" Csg. 75 Sks Cement <i>173'</i>	750' - 8 5/8" Csg. 50 Sks Cement <i>357</i>
2692' - 4 1/2" Csg. 250 Sks Cement Perf. 2590-2610' <i>calc top 16'</i> <i>yates</i>	3808' - 5 1/2" Csg. 125 Sks. Cement Perf. 3387-3404 3620-3630 3761-3777 <i>calc top 2076</i> <i>2576</i> <i>2465</i>	3835'-5 1/2" Csg. 175 Sks Cement Perf. 3418-3426 <i>Panrose DB</i> <i>Middle DB</i> <i>Lower DB</i> 3760-3778 <i>DB</i> <i>1954</i>	3751' - 5 1/2" Csg. 100 Sks Cement Perf. 3640-3656 <i>Panrose calc top</i> <i>2576</i> <i>(middle)</i> <i>DB</i>	3895' - 5 1/2" 150 Sks Cement Perf. 3774-3 3799-3
T.D. 2692'. Note: Tension Pkr will be set near shoe on plastic coated tbgs.	T.D. 3808'. Note: The 3 zones will be isolated by using Baker flow valve and pkrs. arrangement w/1 string of 2"	T.D. 3850'. Note: The 3 zones will be isolated w/Baker flow valves & pkrs. run w/ 1 string of 2" plastic coated Tbg.	T.D. 3804'. Note: Panrose Sec will be perf. & will be dually compl. f/inj using Baker flow valve arrangement	T.D. 3895'. Note: Rights from 3500' these two zo will be isol ted using F & flow valv

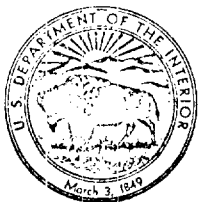
Exhibit D

Lease and Well No.	Hole Size	Size and Depth of Casing	Sacks of Cement Used	Lin. Feet per Sack	Calculated Top of Cement
Shugart A-8	10" 6-1/4"	8-5/8" @ 27' 4-1/2" @ 2,692'	10 250	7.87 10.71	Circulated 16'
Shugart C-3	10" 7"	8-5/8" @ 757' 5-1/2" @ 3,751'	75 100	7.87 10.75	173" 2,676'
Shugart D-1	10" 7"	8-5/8" @ 763' 5-1/2" @ 3,808'	110 125	7.87 10.75	Circulated 2,465'
Shugart D-8	10" 7"	8-5/8" @ 755' 5-1/2" @ 3,835'	75 175	7.87 10.75	173" 1,954'
Kenwood Fed. 3	10" 7"	8-5/8" @ 750' 5-1/2" @ 3,895'	50 150	7.87 10.75	357" 2,283'

BEFORE EXAMINER NOTTER
 OIL FIELD REVENUE COMMISSION
 EXHIBIT NO. D
 CASE NO. 3779

FLOOD NO. 4 SHUGART
EDDY COUNTY, NEW MEXICO





IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Drawer U
Artesia, New Mexico 88210

May 29, 1968

Shenandoah Oil Corporation
% Jennings and Copple
Post Office Box 1180
Roswell, New Mexico 88201

Gentlemen:

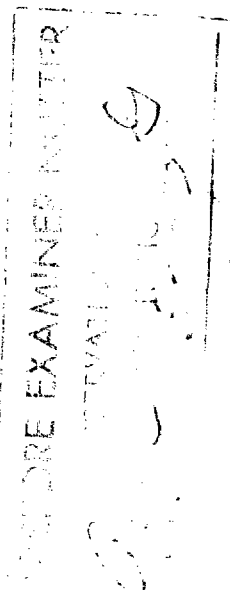
Your letter of May 23, 1968 requests approval to operate a waterflood of the Yates, Seven Rivers, Queen, and Grayburg formations in T. 18 S., R. 31 E., N.M.P.M., Eddy County, New Mexico, on that portion of Oil and Gas leases described as follows:

<u>Lease Number</u>	<u>Description</u>
Las Cruces 029387(a)	sec. 29: S $\frac{1}{2}$
Las Cruces 029387(b)	sec. 20: SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 30: NE $\frac{1}{4}$ SE $\frac{1}{4}$
Las Cruces 029387(c)	sec. 29: NW $\frac{1}{4}$
Las Cruces 029390(a)	sec. 28: SW $\frac{1}{4}$ NW $\frac{1}{4}$
New Mexico 055648	sec. 28: W $\frac{1}{2}$ SW $\frac{1}{4}$

Initially, you propose to convert to water injection the following wells:

<u>Well No. & Lease</u>	<u>Location</u>
8 Shugart "A"	N SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29
3 Shugart "C"	I NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30
1 Shugart "D"	G SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 30
8 Shugart "D"	A NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 30
3 Kenwood	F SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29

The flood pattern would be an 80-acre 5-spot pattern, and any lease line agreement with adjoining operators should provide for equitable exchange of injection wells along lease lines on all sides of the project. The proposal also plans for expansion of the project by subsequently converting to water injection the following wells:

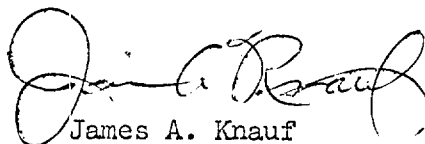


<u>Well No. & Lease</u>	<u>Location</u>
1 Shugart "A"	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29
2 Shugart "A"	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29
9 Shugart "A"	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29
2 Shugart "C"	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30
3 Shugart "D"	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30
7 Shugart "D"	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30
9 Shugart "D"	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 20
1 Keohane "A"	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 28
1 Keohane "B"	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28

The plans for operating the above described waterflood project as proposed in the application is satisfactory to this office and hereby approved subject to like approval by the New Mexico Oil Conservation Commission and the following:

1. This project will be operated in compliance with the New Mexico Oil Conservation Commission regulations governing waterflood operations.
- ✓ 2. Duplicate copies of a monthly progress report (N.M.O.C.C. Form C-120 acceptable) are to be submitted to this office showing the volume of water injected and average pressures for the injection wells and production for the producing wells in the project area.
3. This approval does not preclude the necessity for further approval when the project is expanded to include other wells and leases or the necessity to submit the usual notices and reports on wells involved. When this project is expanded to involve other operators and interests, the correlative rights of all concerned should be considered.

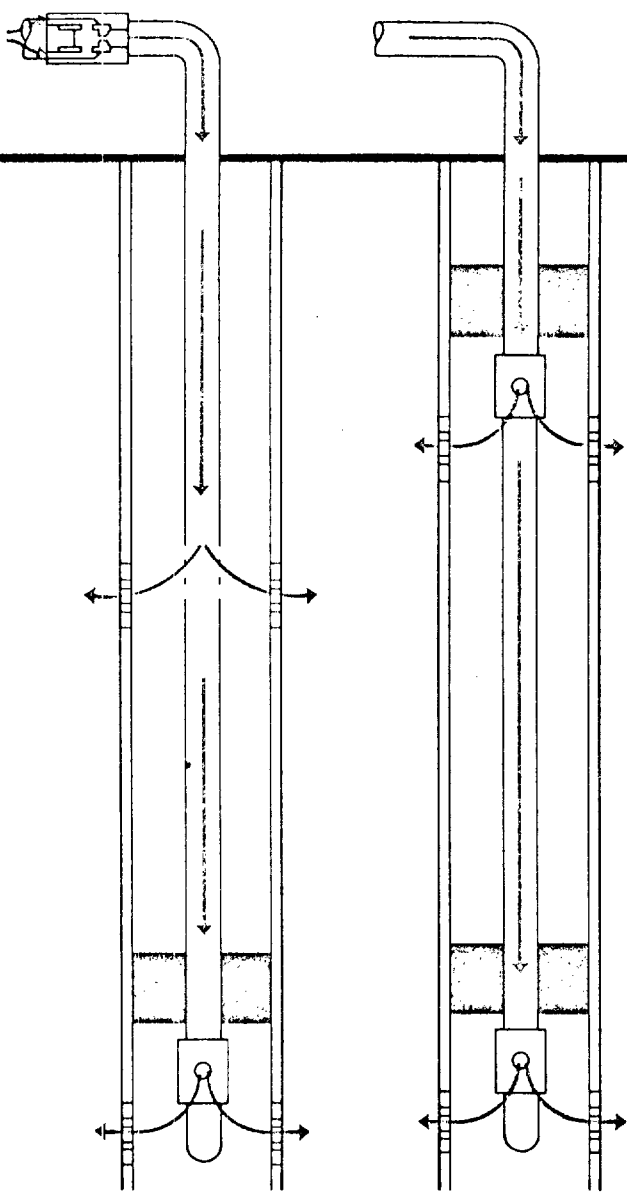
Sincerely yours,



James A. Knauf
District Engineer

cc: N.M.O.C.C., Santa Fe
Roswell
Accounts

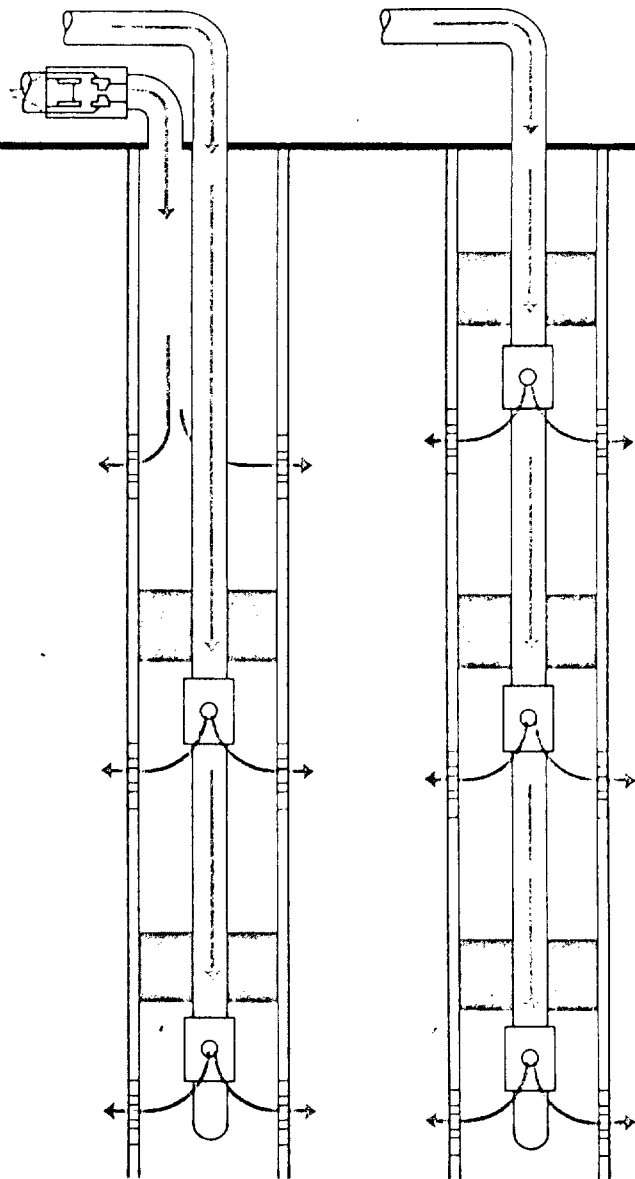
RLBeekman:mh 5/29/68



DUAL ZONE

Hookup at left shows Surface Flow Regulator controlling total flow, and Subsurface Flow Regulator controlling lower zone flow. Balance of total flow injects into upper zone at desired rate, provided that upper zone injection pressure is higher than lower. (Two Surface Regulators could also be used with one controlling flow through tubing to lower zone, the other controlling flow in annulus to upper zone.)

Hookup at right shows straightforward, two-packer, dual-zone flood.



TRIPLE ZONE

Shown are two alternate methods.

Hookup at left uses a Surface Flow Regulator for annulus injection of uppermost zone and Subsurface Regulators for lower zones.

Hookup at right uses three packers with Subsurface Regulators for each zone.

April 27 19 H