

CASE 3464: Appli. of CONTINENTAL
OIL CO. for a waterflood project, _____
Lea County, New Mexico.

CASE NO.

3464

Application,
TRANSCRIPTS,
SMALL Exhibits
ETC.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

October 7, 1966

C
O
P
Y

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Dear Sir:

Reference is made to Commission Order No. R-3131, recently entered in Case No. 3464, approving the Continental Reed-Sanderson Waterflood Project.

Injection is to be through the 13 authorized water injection wells which shall be equipped with tubing and with packers, said packers being set at approximately 3700 feet.

According to our calculations, when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 1092 barrels per day when the Southeast New Mexico waterflood allowable factor is 42.

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

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

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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

ALP/ir

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

Oil Conservation Commission
Hobbs, New Mexico

Case 3464

Filed 9-28-66

Rec. 9-29-66

1. app. Continental request for a water flood in their Reed-Sander-son unit. (Case 3463)
2. The 13 injection wells be correctly listed on Exhibit 4.
3. Injection shall be thru lined tubing and under a packer.
4. Regulate by Rule 701.

Thurs. W.

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. 3464
Order No. R-3131

APPLICATION OF CONTINENTAL 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 September 28, 1966,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 4th day of October, 1966, 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, Continental Oil Company, seeks per-
mission to institute a waterflood project in the Reed-Sanderson
Unit Area, Eumont Pool, by the injection of water into the Queen
formation through thirteen injection wells in Sections 3, 4, 9,
and 10, Township 20 South, Range 36 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.

(5) That the applicant further seeks the establishment of an administrative procedure whereby additional wells could be placed on water injection and additional leases could be included in the waterflood project area.

(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.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to institute a waterflood project in the Reed-Sanderson Unit Area, Eumont Pool, by the injection of water into the Queen formation through the following-described wells in Township 20 South, Range 36 East, NMPM, Lea County, New Mexico:

Reed A-3 Well No. 7, located 660 feet from the North line and 1980 feet from the West line of Section 3

Reed A-3 Well No. 9, located 1980 feet from the North line and 660 feet from the West line of Section 3

Reed A-3 Well No. 10, located 1980 feet from the South line and 1980 feet from the West line of Section 3

Reed A-3 Well No. 13, located 660 feet from the South line and 660 feet from the West line of Section 3

Reed A-3 Well No. 14, located 660 feet from the South line and 2310 feet from the East line of Section 3

Reed A-3 Well No. 16, to be drilled 1980 feet from the North line and 1980 feet from the East line of Section 3

Jim Hewes Well No. 2, located 1980 feet from the South line and 660 feet from the East line of Section 4

Leonard Well No. 3, located 1980 feet from the North line and 660 feet from the West line of Section 10

Argo Leonard Well No. 1, located 2310 feet from the South line and 2310 feet from the West line of Section 10

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CASE No. 3464
Order No. R-3131

Sanderson B-1 Well No. 6, located 660 feet from the
North line and 1990 feet from the West line of
Section 10

Sanderson B-4 Well No. 1, located 660 feet from the
North line and 660 feet from the East line of
Section 4

Sanderson B-9 Well No. 1, located 660 feet from the
North line and 660 feet from the East line of
Section 9

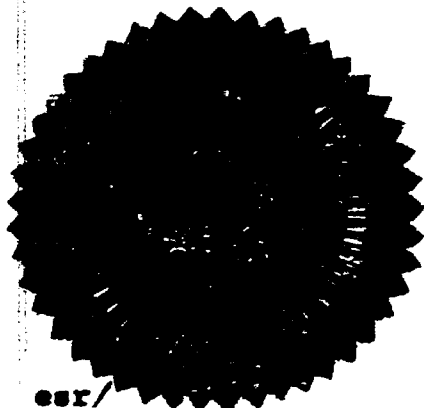
Etcheverry Well No. 1, located 2310 feet from the
North line and 1650 feet from the East line of
Section 10

(2) That the subject waterflood project is hereby designated the Reed-Sanderson 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 said waterflood project to include additional injection wells and leases as may be necessary to complete an efficient waterflood injection pattern in the Reed-Sanderson Unit Area.

(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

Guyton B. Hays
GUYTON B. HAYS, Member

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

esr/

- CASE 3464: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Queen formation through 13 wells located in Sections 3, 4, 9, and 10, Township 20 South, Range 36 East, Eumont Pool, Lea County, New Mexico.
- CASE 3465: Application of Amerada Petroleum Corporation for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Jenkins-Cisco Pool underlying the SW/4 of Section 19, Township 9 South, Range 35 East, Lea County, New Mexico.
- CASE 3466: Application of Skelly Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Lovington Paddock Unit Area comprising 3325 acres, more or less, of Federal, fee and State lands in Townships 16 and 17 South, Ranges 36 and 37 East, Lea County, New Mexico.
- CASE 3467: Application of Skelly Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Lovington Paddock Unit by the injection of water into the Lovington Glorieta (Paddock) formation through 22 wells located in said unit area, Lovington Paddock Pool, Lea County, New Mexico.
- CASE 3468: Application of Tenneco Oil Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Grayburg-Jackson West Cooperative Unit Area comprising 2,000 acres, more or less, of State and fee lands in Township 17 South, Range 29 East, Eddy County, New Mexico.
- CASE 3469: Application of Gulf Oil Corporation for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Springs Unit Area comprising 5,139 acres, more or less, of Federal and fee lands in Township 20 South, Range 26 East, and Township 21 South, Range 25 East, Eddy County, New Mexico.
- CASE 3470: Application of Gulf Oil Corporation for a special gas-oil ratio limitation, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 506 of the Commission Rules and Regulations to provide for a limiting gas-oil ratio of 6000 cubic feet of gas per barrel of oil in the Justis Blinbry Pool, Lea County, New Mexico.

ir/

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 28, 1966

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

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

- CASE 3459: Application of Pennzoil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg-San Andres formation through eight wells located in Sections 28 and 33, Township 17 South, Range 33 East, Maljamar Pool, Lea County, New Mexico.
- CASE 3460: Application of Penroc Oil Corporation for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill and complete a well at an unorthodox location 1,500 feet from the South and East lines of Section 19, Township 21 South, Range 24 East, Indian Basin-Upper Pennsylvanian Gas Pool, Eddy County, New Mexico. Applicant, upon completion of said well in the Upper Pennsylvanian formation, proposes to abandon its Indian Federal Well No. 1, located in Unit G of said Section 19, insofar as the Upper Pennsylvanian formation only is concerned.
- CASE 3461: Application of Cities Service Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Southeast Maljamar Grayburg-San Andres Unit Area comprising 1,080 acres, more or less, of State and Federal lands in Sections 29, 30 and 32, Township 17 South, Range 33 East, Lea County, New Mexico.
- CASE 3462: Application of Cities Service Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Southeast Maljamar Grayburg-San Andres Unit by the injection of water into the Grayburg-San Andres formation through eleven wells located in Sections 29, 30 and 32, Township 17 South, Range 33 East, Lea County, New Mexico.
- CASE 3463: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Reed-Sanderson Unit Area comprising 1041 acres, more or less, of Federal and fee lands in Township 20 South, Range 36 East, Lea County, New Mexico.

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3464

BEFORE THE OIL CONSERVATION COMMISSION
OF THE
STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF
CONTINENTAL OIL COMPANY FOR APPROVAL
OF THE REED-SANDERSON UNIT AGREEMENT
EMBRACING 1040.83 ACRES, MORE OR LESS,
LOCATED IN SECTIONS 3, 4, 9, AND 10,
TOWNSHIP 20 SOUTH, RANGE 36 EAST, NMPM,
LEA COUNTY, NEW MEXICO, AND FOR PER-
MISSION TO INSTALL AND OPERATE A WATER-
FLOOD WITHIN THE BOUNDARIES OF SAID
UNIT AREA

A P P L I C A T I O N

Comes now Applicant, Continental Oil Company, and
respectfully requests approval of the Reed-Sanderson Unit
Agreement embracing 1040.83 acres, more or less, described
as:

W/2 and W/2 E/2 Section 3,
E/2 E/2 Section 4,
E/2 NE/4 Section 9,
NW/4, W/2 NE/4, NE/4 SW/4
and NW/4 SE/4 Section 10,
Township 20S, Range 36E,
Lea County, New Mexico

and for permission to install and operate a waterflood within
said unit, and in support thereof Applicant would show:

1. That the Reed-Sanderson Unit Agreement is
attached hereto and marked Exhibit 1.
2. That designation of Unit Area and preliminary
approval of the Unit Agreement by the U.S.
Geological Survey was given April 29, 1966.
3. That the attached lease plat marked Exhibit 2
shows the Reed-Sanderson Unit and surrounding
area.
4. That production in the Unit Area is at an
advanced stage of depletion and that recovery
by primary methods is at or near the economic
limit.

DOCKET MAILED

Date 9-15-66

CL

5. That engineering investigations indicate that waterflooding the Reed-Sanderson Unit Area will be physically and economically feasible.
6. That agreement between the Working Interest Owners has proceeded to the extent that a logical and systematic secondary recovery operation is assured.
7. That the formation to be unitized and waterflooded is the Queen formation which is specifically indicated on the radioactivity log of the Continental Oil Company Reed A-3 No. 15 well attached hereto and marked Exhibit 3.
8. That all proposed injection wells are or will be completed in such a manner that injected water will be confined to the unitized formation. The present status of all proposed injection wells is shown on the tabulation of injection well data attached hereto and marked Exhibit 4, and on the schematic diagrams attached hereto and marked Exhibits 4-1 through 4-13.
9. That applicant proposes to inject a total of approximately 5,000 barrels of water per day into the 13 proposed injection wells on an 80-acre five-spot pattern. Said water will be obtained from the Eunice-Monument-Eumont Salt Water Disposal system.
10. That the said waterflood will be installed and operated in conformance with Rule 701E.
11. That the proposed unitization and secondary recovery will result in the recovery of hydrocarbons which would not be recovered by primary methods and is therefore in the interest of conservation and prevention of waste.

Application to NMOCC
Page 3

Wherefore, Applicant respectfully requests that this matter be set for hearing before the Commission's duly qualified Examiner and that upon hearing an order be entered approving the Reed-Sanderson Unit Agreement, and granting permission to install and operate a waterflood within the Unit Area as described herein above.

Respectfully submitted,

L. P. Thompson
L. P. THOMPSON
District Manager
Hobbs District

LPT-JS

REED-SANDERSON UNIT - INJECTION WELL DATA

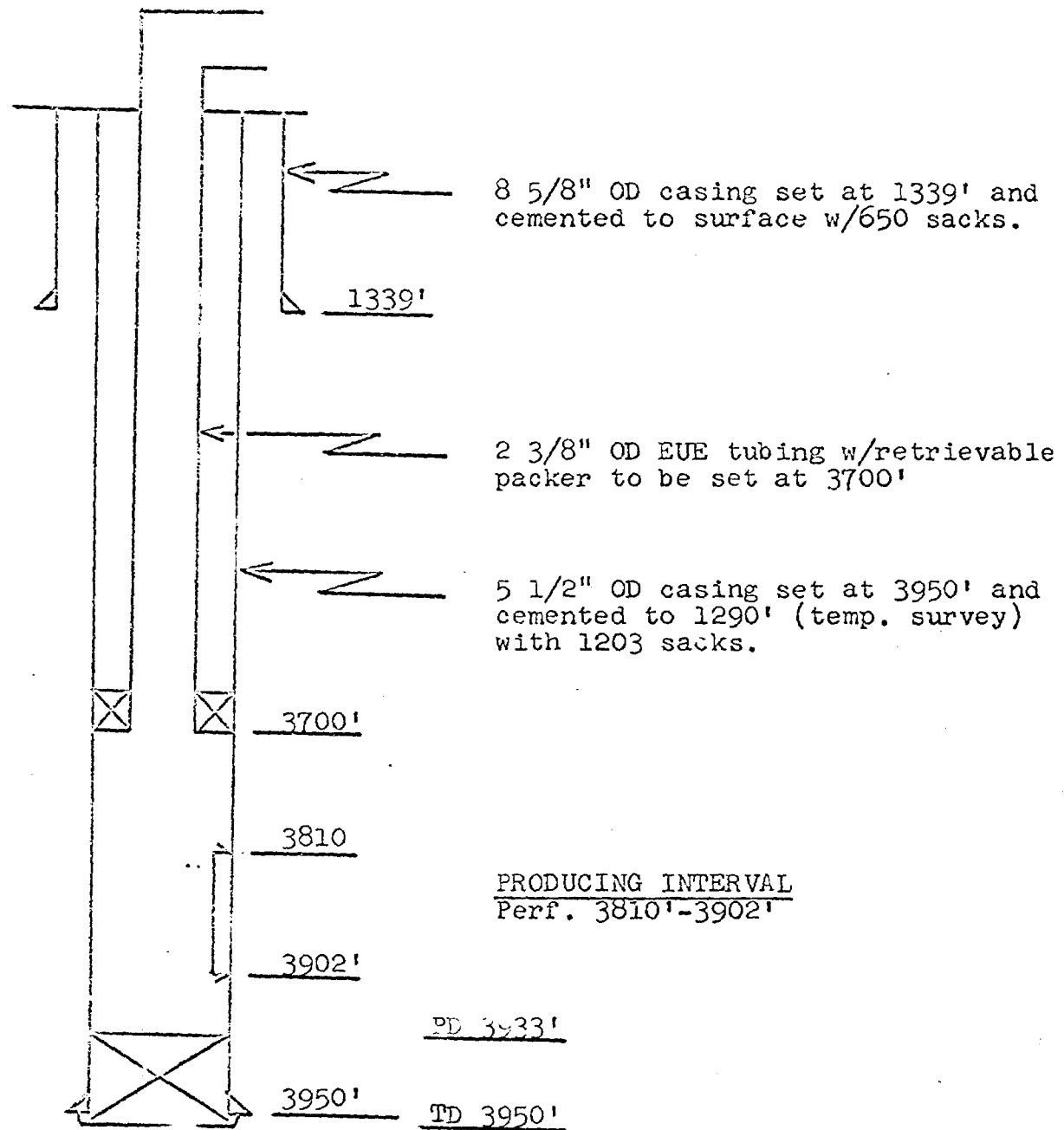
EXHIBIT 4

Company, Lease and Well No.	Total Depth and/or PBD	SURFACE CASING			PRODUCTION CASING			PRODUCING INTERVAL Perforations/OH
		Size	Depth	Cement	Size	Depth	Cement	
CONFINEMENT OIL COMPANY								
Reed A-3 No. 7	3950'/3933'	8 5/8"	1339'	650	5 1/2"	3950'	1203	3810'-3902'
660' FNL&1980' FNL Sec. 3-20-36								
Reed A-3 No. 9	4010'/4000'	8 5/8"	1372'	600	5 1/2"	4009'	1402	3914'-36', 3946-78', 3988-98'
1980' FNL&660' FNL Sec. 3-20-36								
Reed A-3 No. 10	3950'/3946'	8 5/8"	1334'	650	5 1/2"	3949'	1045	3806-46', 3862'-82', 3888-98', 3910-30'
1980' FNL&FNL Sec. 3-20-36								
Reed A-3 No. 13	4000'/3992'	8 5/8"	334'	225	5 1/2"	3999'	1530	3793-3810, 3824-46', 3860-76', 3888-3930', 3944-60', 3972-86'
660' FNL&660' FNL Sec. 3-20-36								
Reed A-3 No. 14	4000'	8 5/8"	318'	250	5 1/2"	3999'	1395	3784-3838', 3848'-82', 3892-3903', 3918-28', 3942-50'
660' FNL&2310' FNL Sec. 3-20-36								
Reed A-3 No. 16 (to be drilled)	3860'	7 5/8"	400'	250	4 1/2"	3860'	400	3790-3860' (overall)
1980' FNL&1980' FNL Sec. 3-20-36								
Jim Hewes No. 2	4100'/4092'	8 5/8"	343'	250	5 1/2"	4099'	1391	3866-98', 3908-24', 3929-38', 3972-84', 3989-4010', 4026-60'
1980' FNL & 660' FNL Sec. 4-20-36								
Leonard No. 3	4020'/4017'	8 5/8"	339'	250	5 1/2"	4019'	1225	3796-3805', 3811-27', 3910-14', 3920-75', 3980-98', 4006-14'
1980' FNL&660' FNL Sec. 10-20-36								
Argo Leonard No. 1	4030'	8 5/8"	300'	200	5 1/2"	4029'	2300	3838-44', 3856-79', 3882-86', 3903-13', 3918-30', 3946-48', 3958-62'
2310' FNL&FNL Sec. 10-20-36								
Sanderson B-1 No. 6	4060'/3996'	8 5/8"	325'	225	5 1/2"	4059'	1439	3790-3800', 3810-34', 3870-86', 3902-08', 3917-24', 3928-32', 3954-75'
660' FNL&1990' FNL Sec. 10-20-36								
Sanderson B-4 No. 1	4100'/4090'	8 5/8"	322'	225	5 1/2"	4099'	1308	3894-3910', 3932-58', 4001-08', 4020-50', 4065'-79'
660' FNL&FNL Sec. 4-20-36								
Sanderson B-9 No. 1*	10640'/4083'	13 3/8"	634'	650	7"	4099'	125	3950-65', 3981-4007', 4016-27', 4038-48'
660' FNL&660' FNL Sec. 9-20-36								
TWO STATES								
Etchoverry Well No. 1	3894'	7 5/8"	243'	175	5 1/2"	3684'	250	OH 3684-3894'
2310' FNL&1650' FNL Sec. 10-20-36								

*Sanderson B-9 No. 1 also has intermediate casing - 9 5/8" set at 3360' w/1864 sacks cement.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 7
660' FNL & 1980' FWL Sec. 3-20-36
Elev.: BH' - 3616'
DF - 3626'

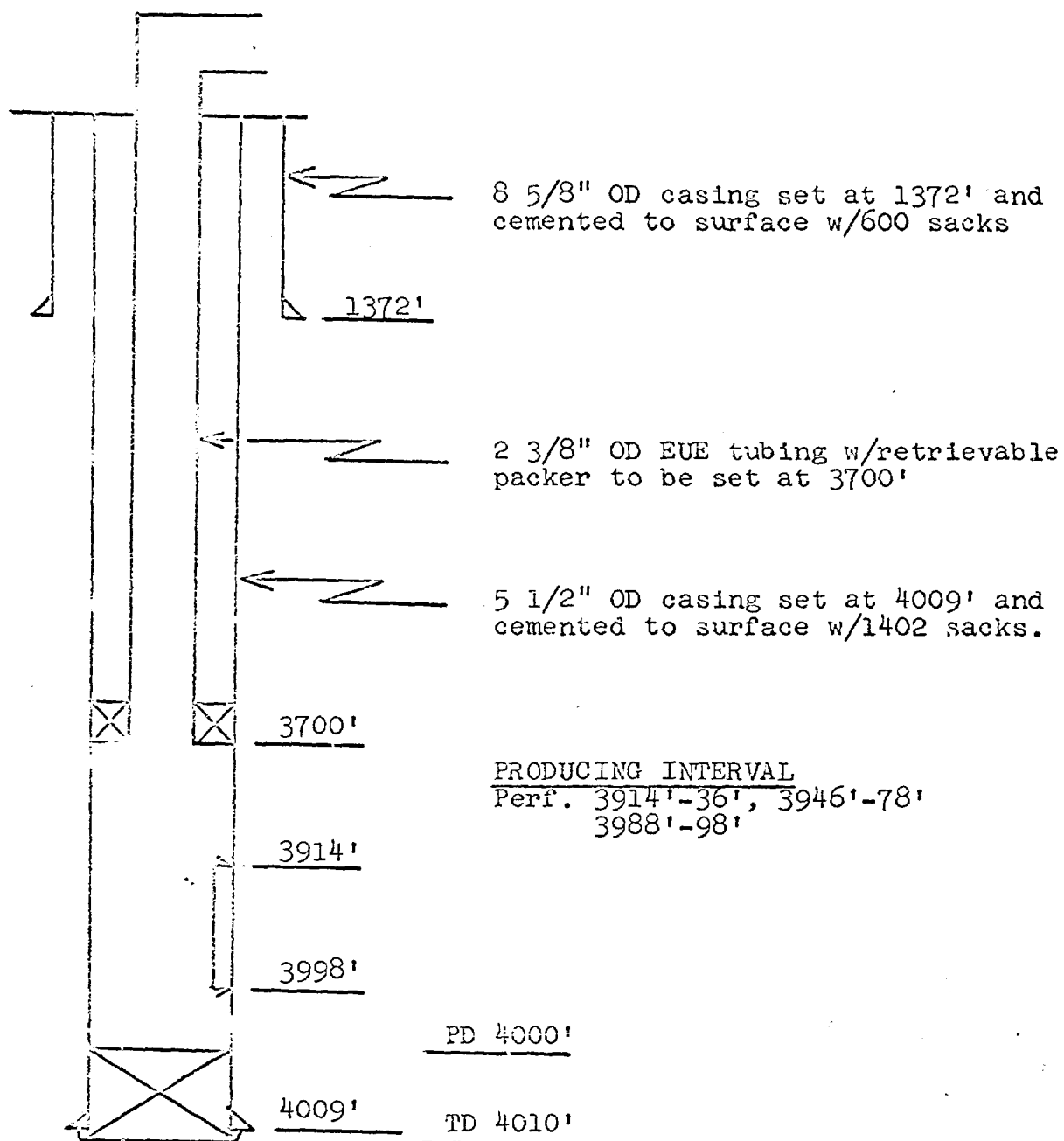


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3910'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 9
1980' FNL & 660' FWL Sec. 3-20-36
Elev.: BHF - 3621'
DF - 3631'

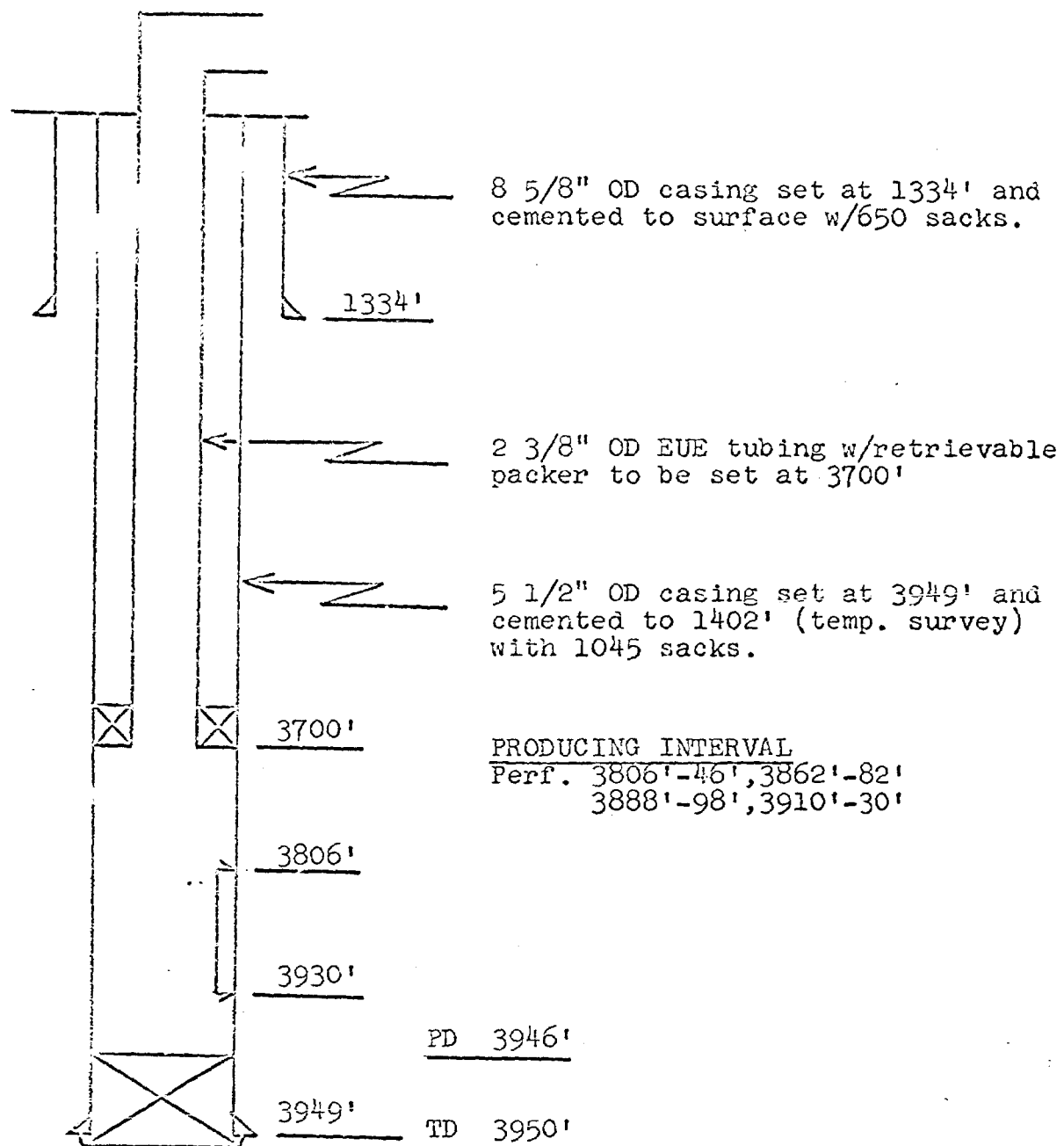


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to PD of 4000'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 10
1980' FSL & FWL Sec. 3-20-36
Elev.: BHF - 3616'
DF - 3626'

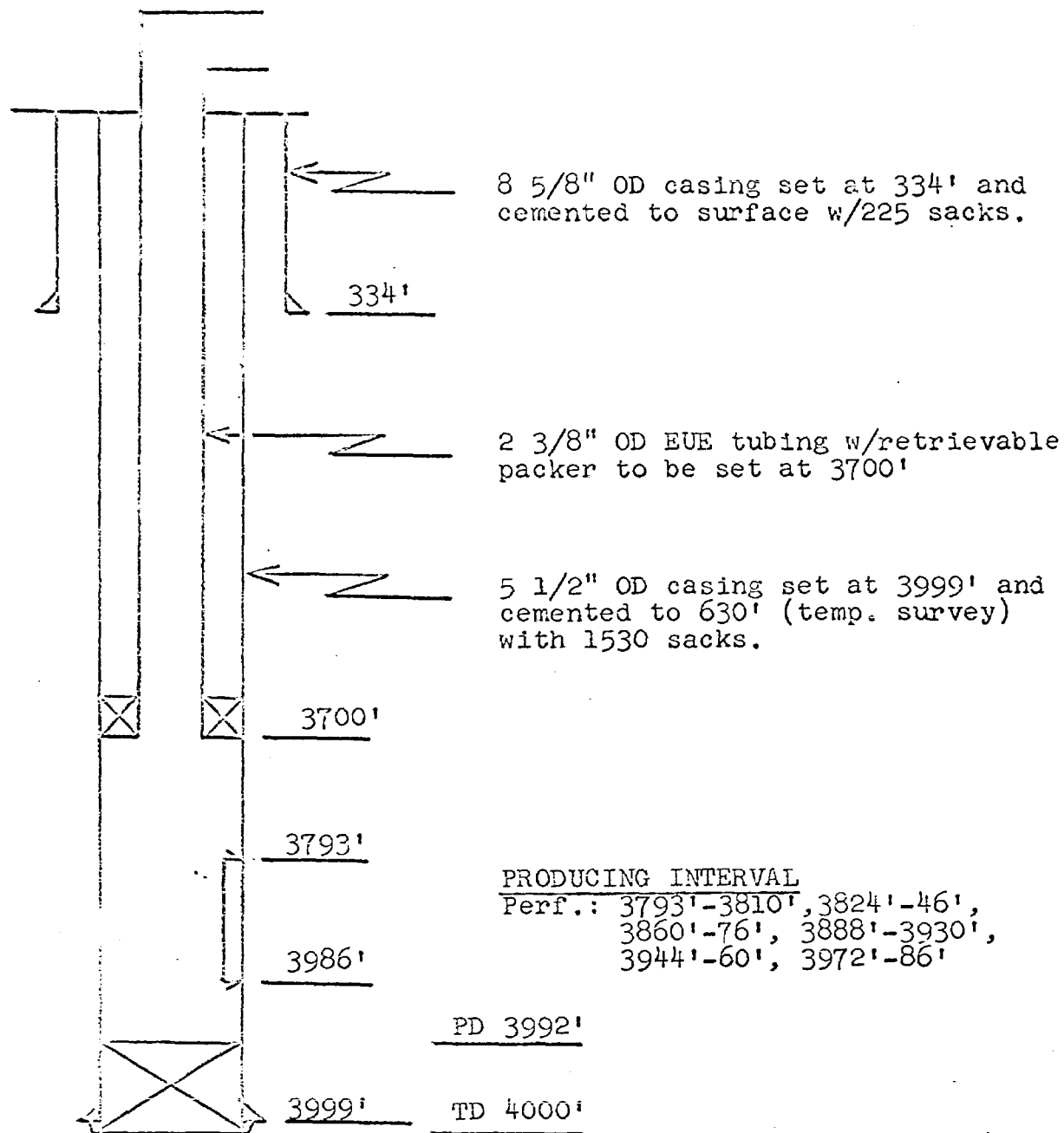


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3935'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 13
660' FSL & 660' FWL Sec. 3-20-36
Elev.: BHF - 3616'
DF - 3626'

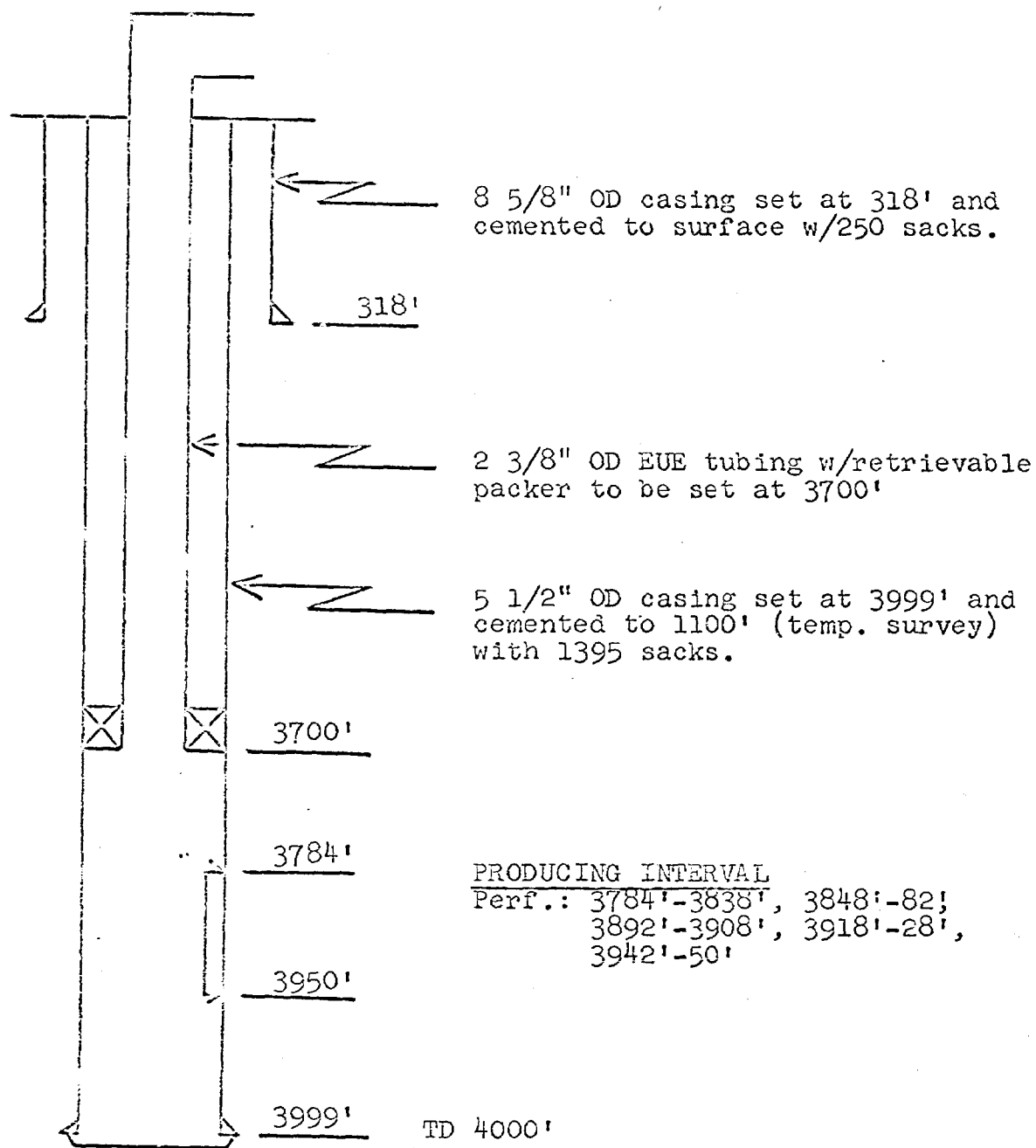


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to PD of 3992'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 14
660' FSL & 2310' FEL Sec. 3-20-36
Elev.: 3609' - BHP
3619' - DF

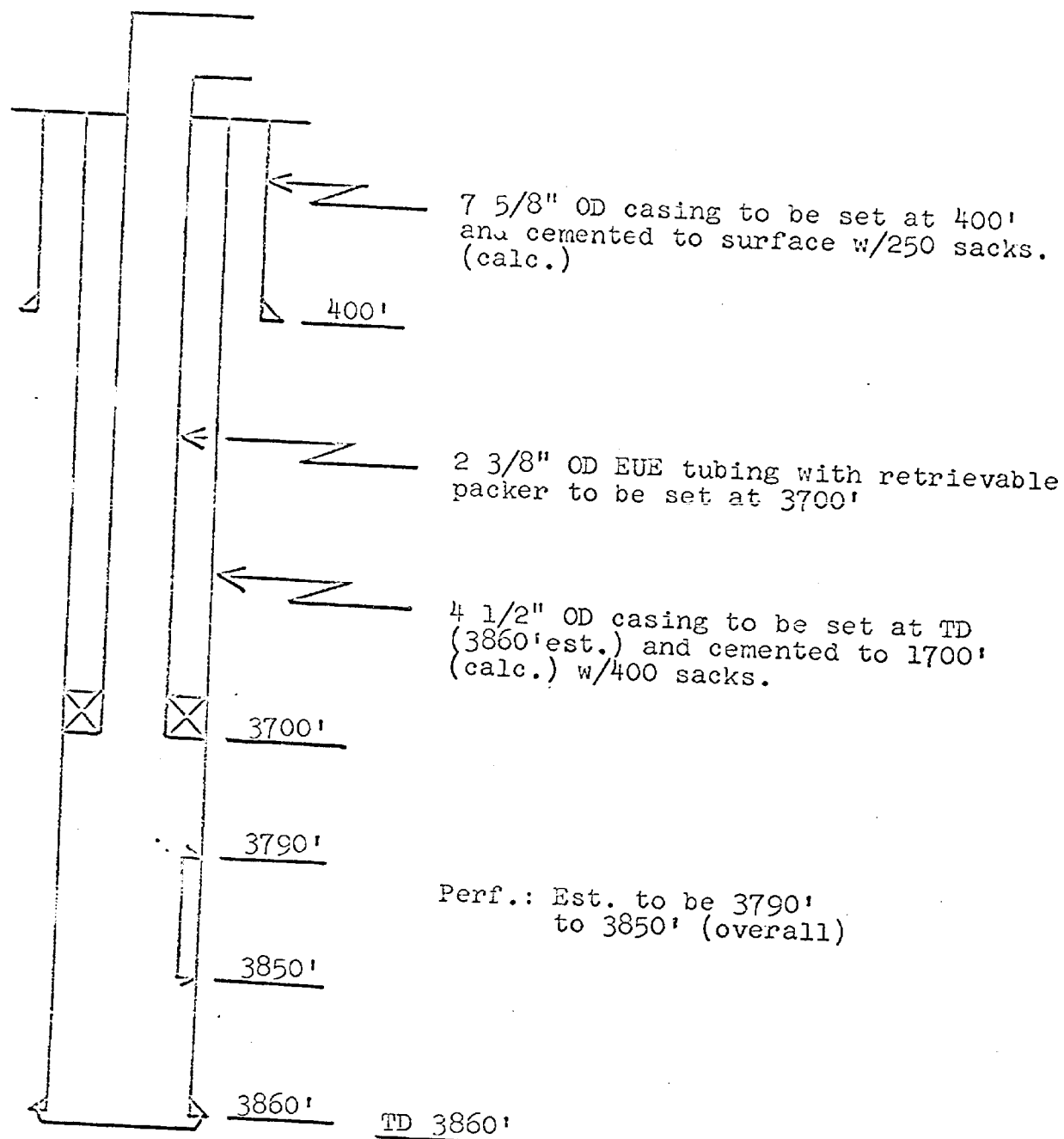


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3950'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 16
1980' FNSBL Sec. 3-20-36
(To Be Drilled)
Elev.: BH₁ - 3610' (E)
DP - 3620' (E)



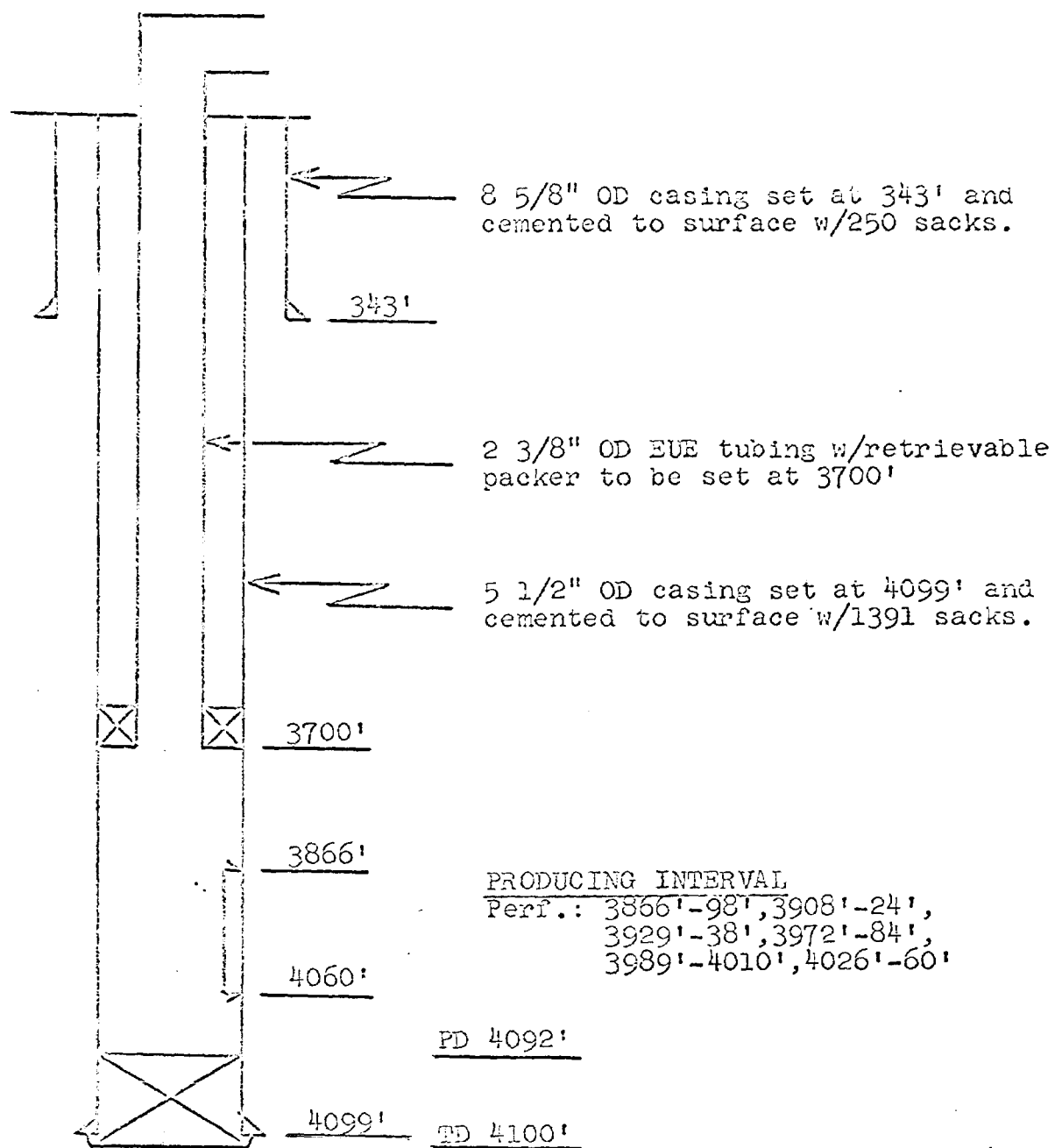
PROPOSED PROCEDURE

After well is completed (production string set
and pay zone perforated and stimulated).

1. Run tubing with retrievable packer to be
set 90' above top perforated zone (est.
3700').
2. Connect up well for injection down the
tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Jim Howes No. 2
1980' FSL & 660' FEL Sec. 4-20-36
Elev.: BMF - 3625'
DF - 3635'

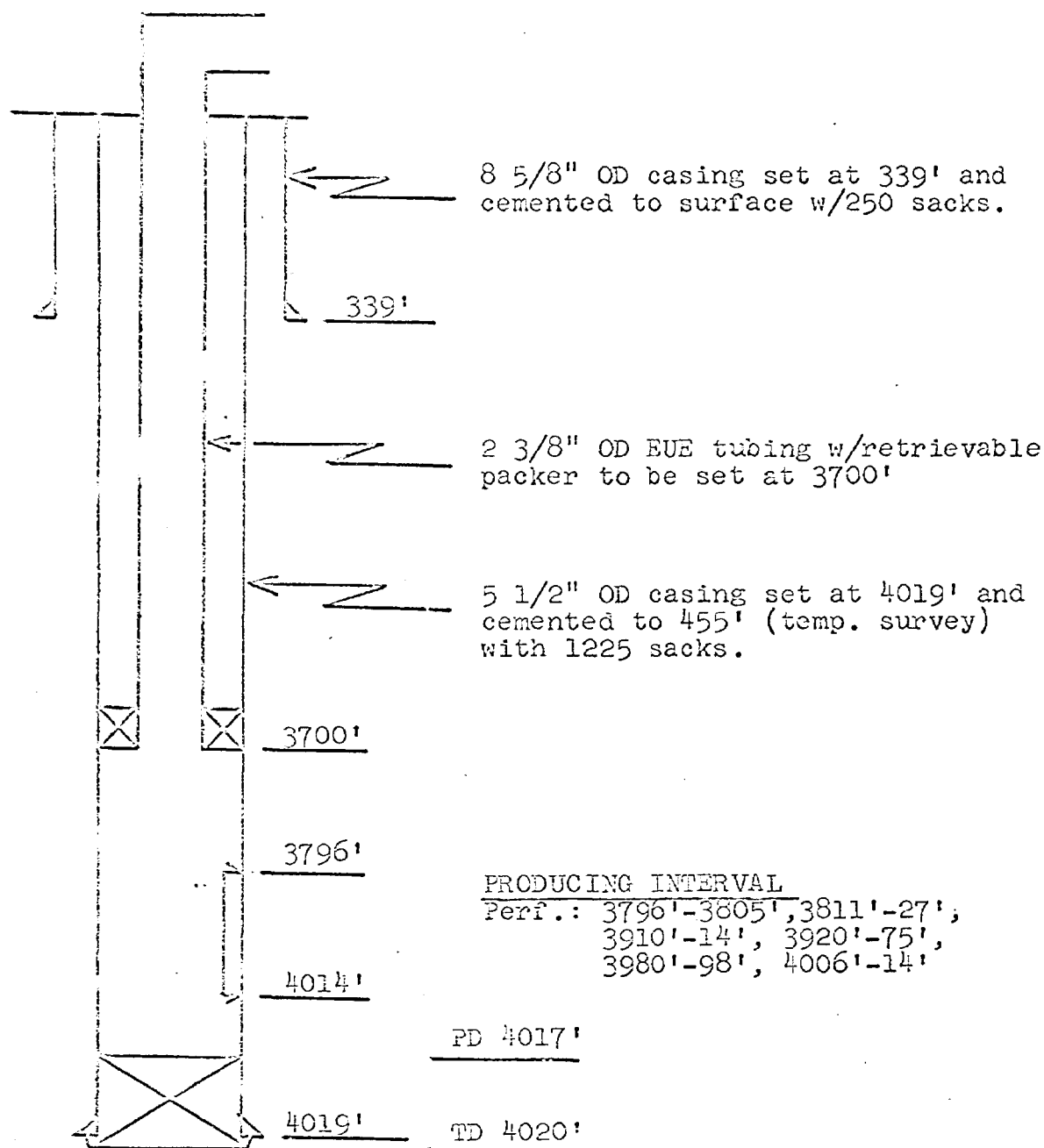


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 4065' (if necessary).
2. Run tubing w/retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Leonard No. 3
1980' FNL & 660' FNL Sec. 10-20-36
Elev.: BHF - 3598'
DF - 3608'

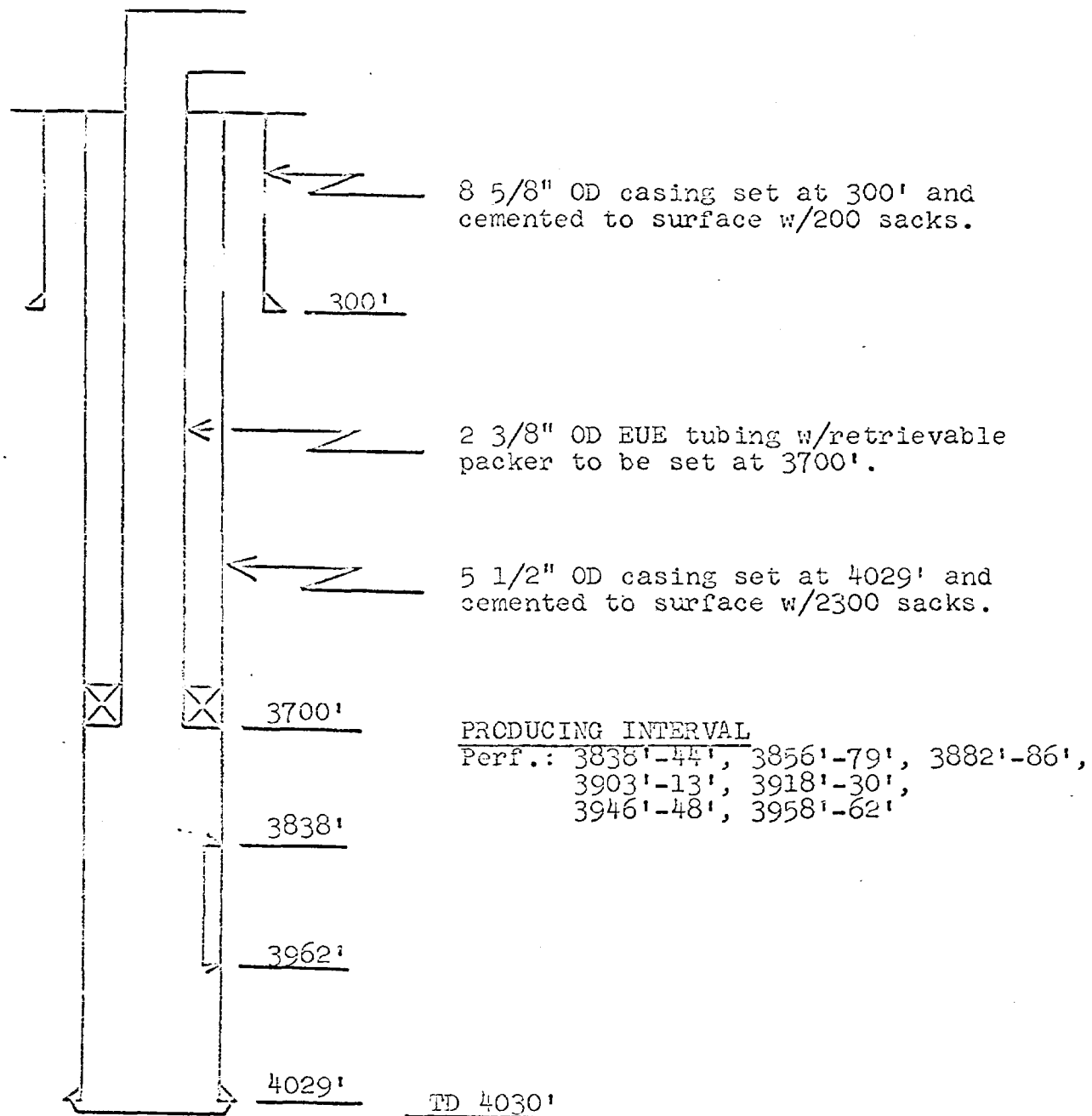


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to PD of 4017'.
2. Run tubing w/retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Argo Leonard No. 1
2310' FSL & 2310' FWL Sec. 10-20-36
Elev.: BHF - 3595'
DF - 3605'

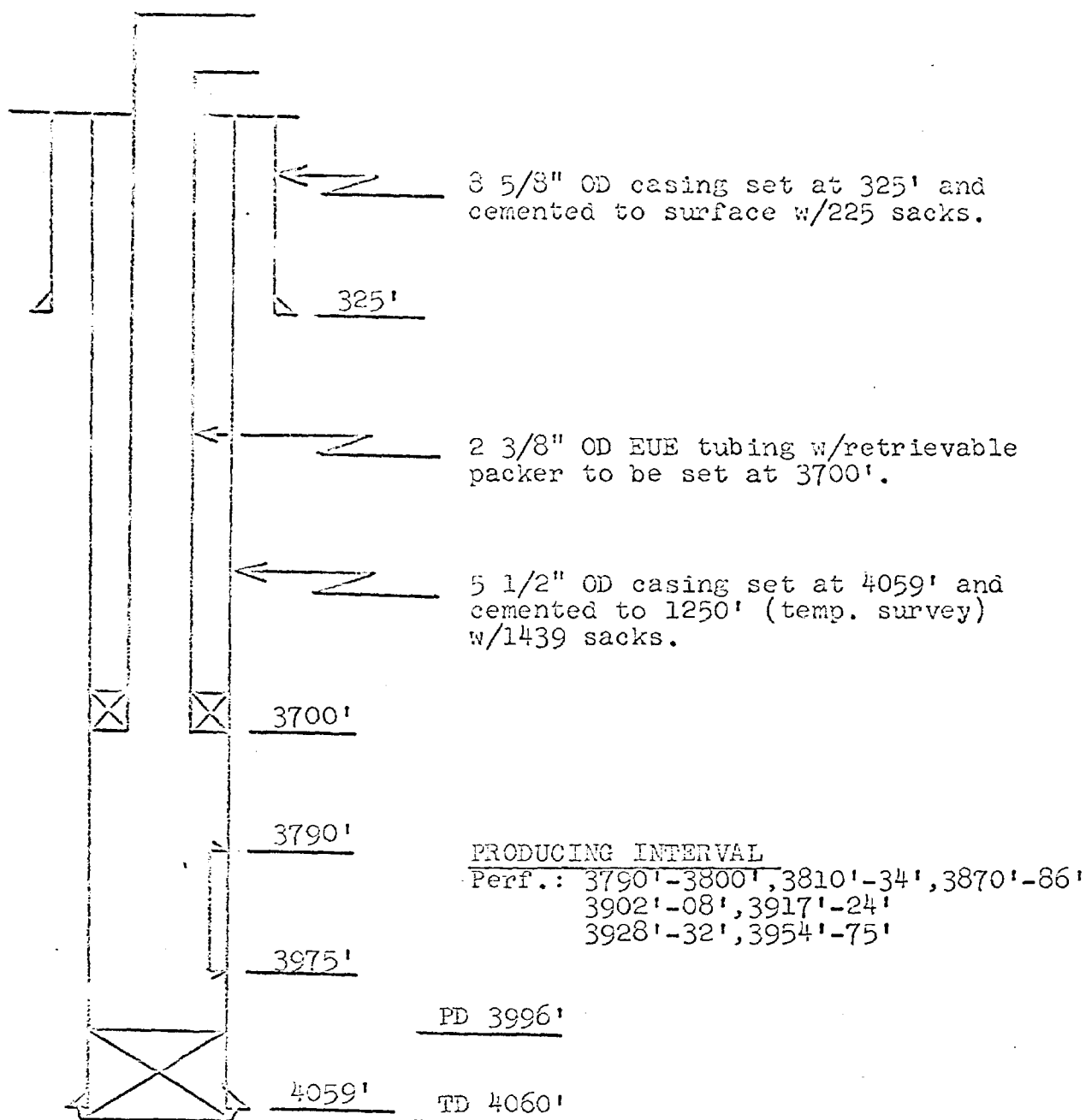


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3970'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Sanderson B-1 No. 6
660' FNL & 1990' FNL Sec. 10-20-36
Elev.: BHF - 3601'
DF - 3609'

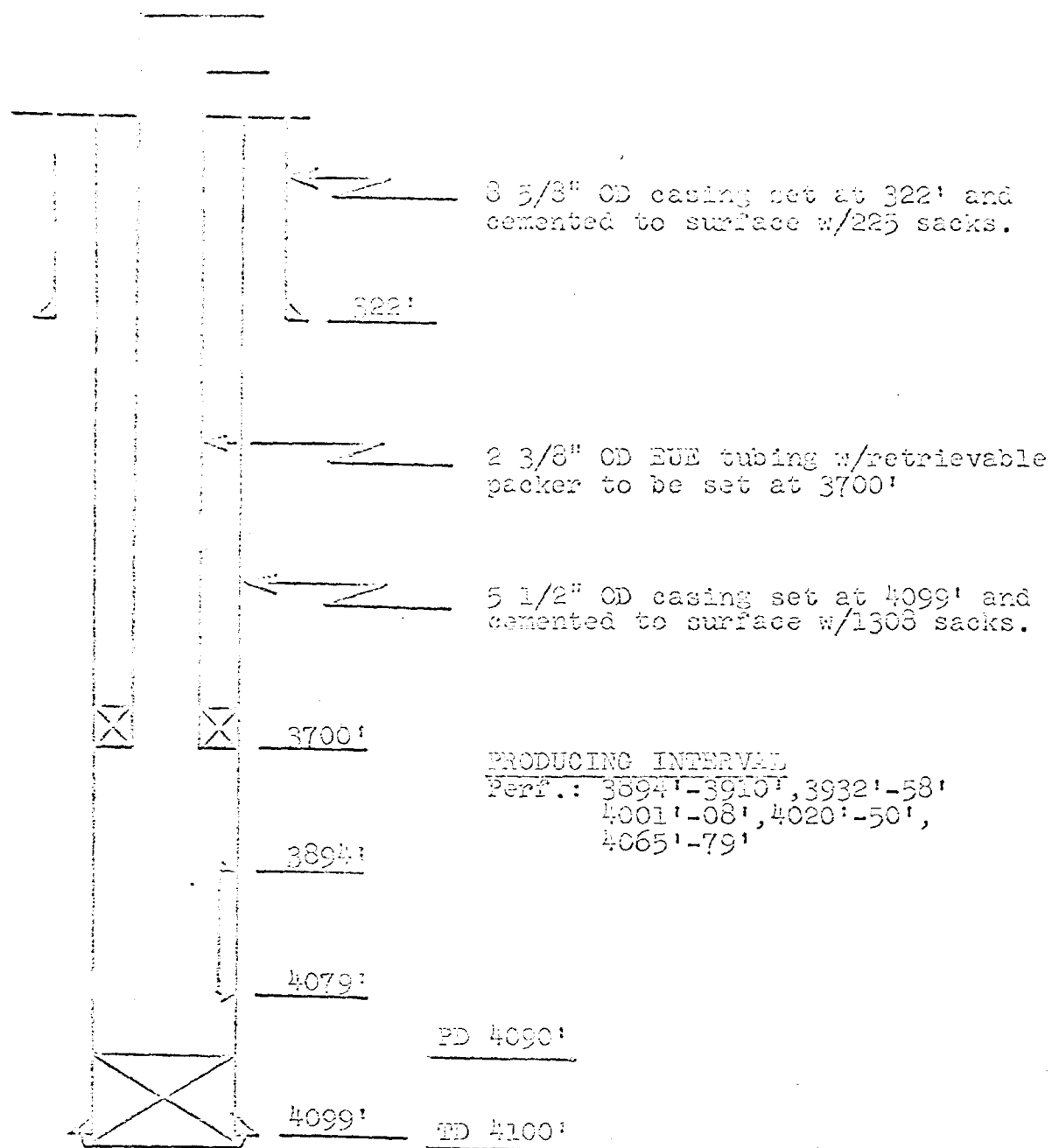


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3980'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WELL LOG - 100' DEEP

Continental Oil Company
Lundgren No. 1
660' Borehole, Dec. 4-20-36
Rev.: B.P. - 3628'
D.P. - 3638'

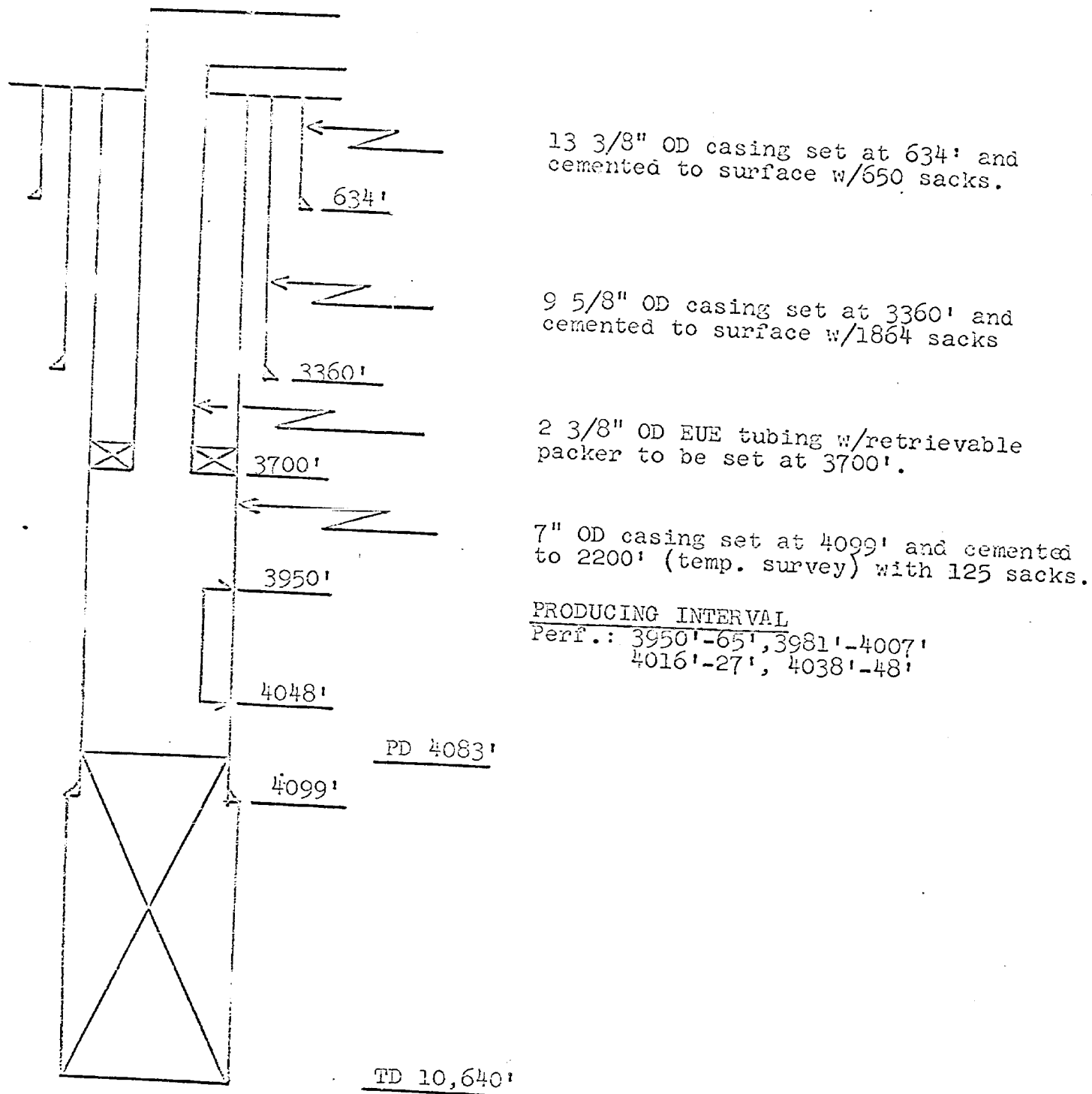


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 4085'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Sanderson B-9 No. 1
660' FNL & 660' FEL Sec. 9-20-36
Elev.: BHF - 3614'
DF - 3626'

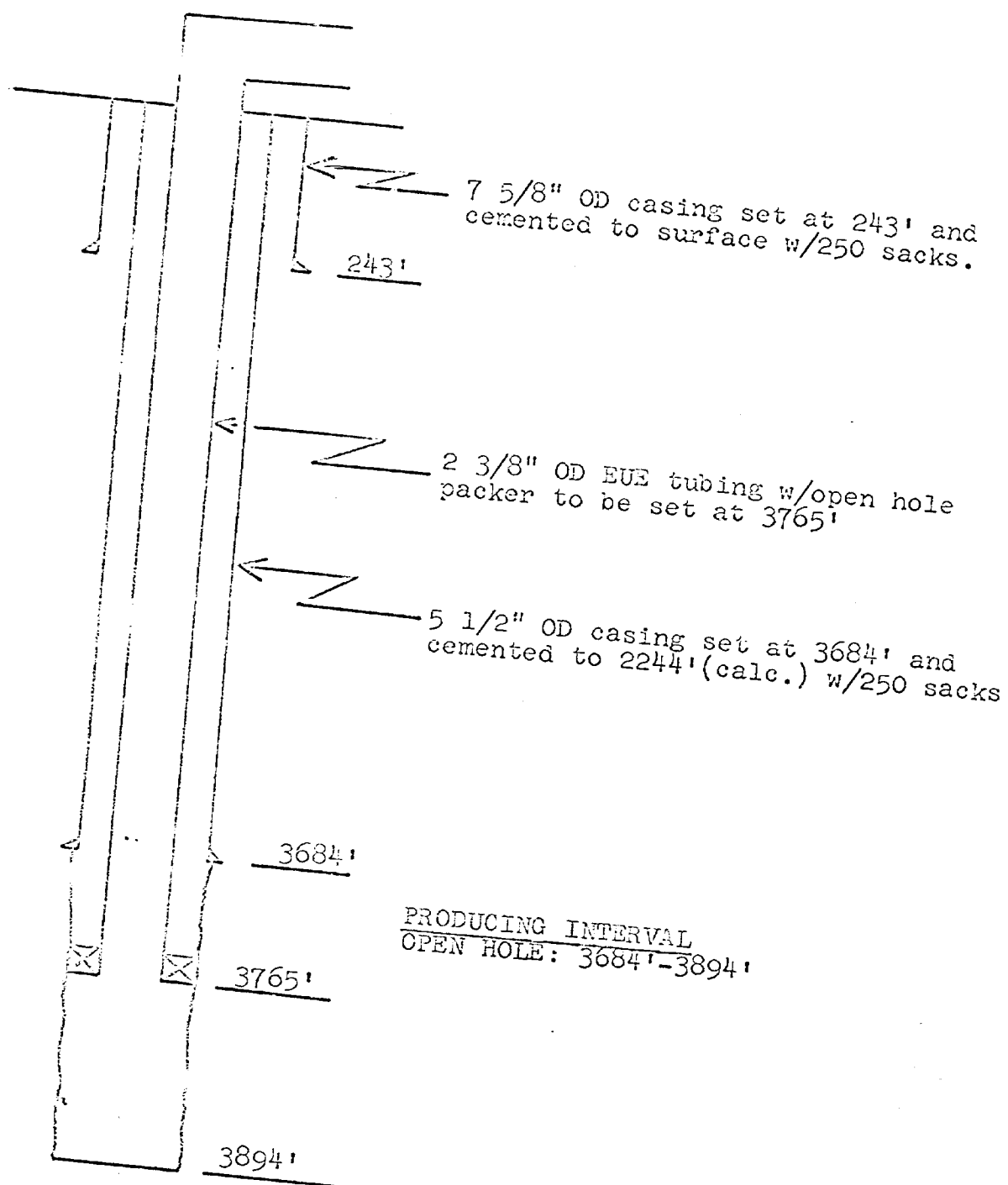


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 4055'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

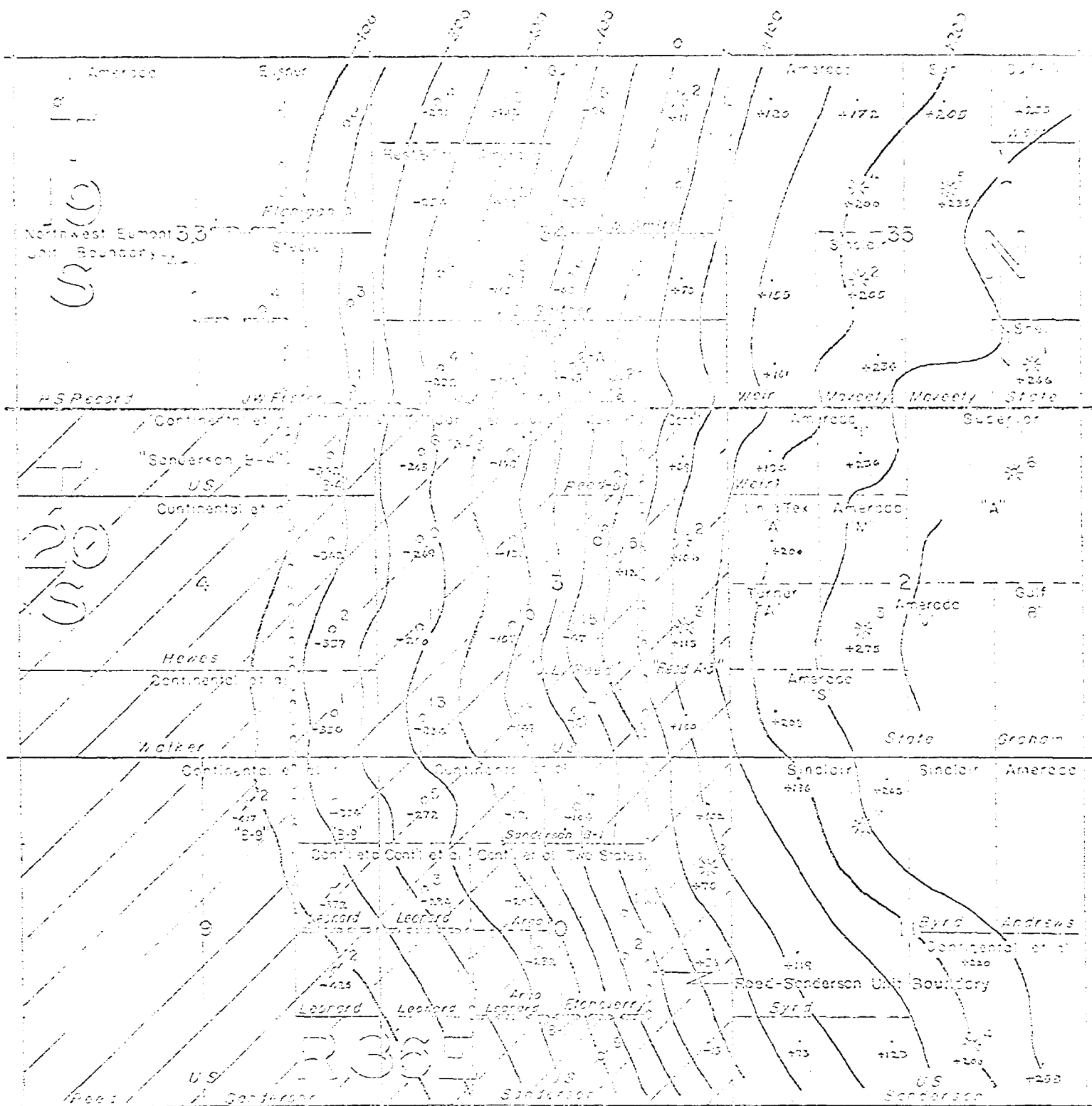
WATER INJECTION WELL DATA

Two States
Etcheverry No. 1
2310' FNL & 1650' FEL Sec. 10-20-36
Elev.: BHF - 3590'
DF - 3600'



PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3894'.
2. Run tubing with open hole packer to be set at approximately 3765' (-165').
3. Connect up well for injection down the tubing.



Only Eumont Yates, Seven Rivers, Queen (Oil)
and Eumont Queen (Gas) Wells Shown

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
HOBBES DISTRICT
EUMONT YATES, SEVEN RIVERS,
QUEEN OIL POOL
Lee County, New Mexico
REED-SANDERSON UNIT
LOWER QUEEN-PENROSE STRUCTURE MAP
Contour Interval 50'

SUMMARY DATA SHEET

REED-SANDERSON UNIT

General

1. Area, Acres	1040.83
2. Number of Producing Oil Wells	24
3. Number of Plugged and/or Abandoned Wells	2
4. Cumulative Oil Production at 7-1-66, bbls.	1,483,403
5. Average Daily Oil Production Per Well, June 1966, bbls	5.2
6. Average Daily Water Production Per Well, June 1966, bbls	2.9
7. Average Gas-Oil Ratio, June 1966, CF/B	21,800
8. Estimated Life of Waterflood Operation, Years	10

Geological Data

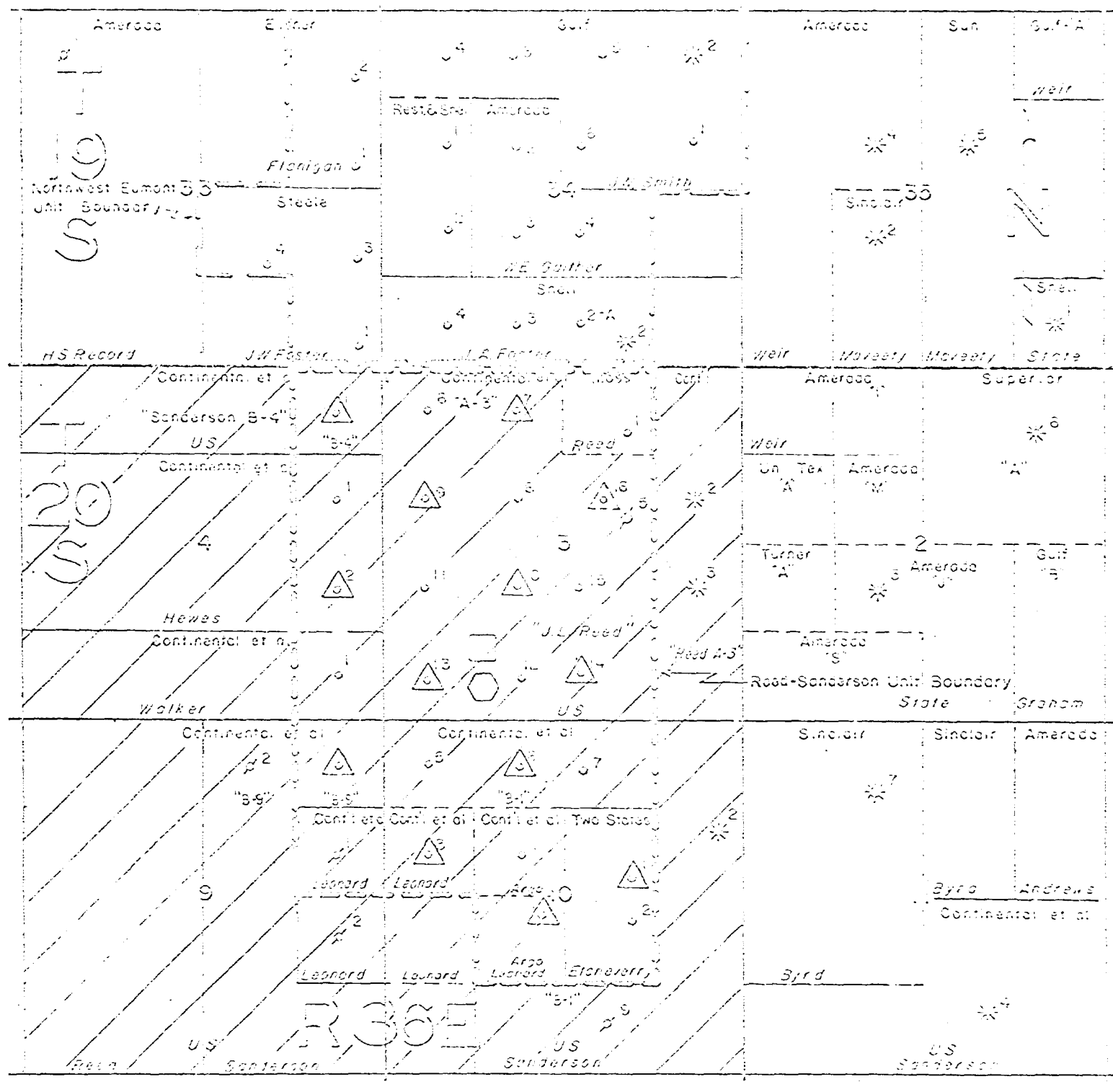
1. Producing Formation	Queen
2. Average Depth, Feet	3,875
3. Type Structure	Flank of Anticline
4. Estimated Gas-Oil Contact, Feet	-150
5. Primary Pore Volume Acre-Feet	14,354
6. Secondary Pore Volume, Acre-Feet	10,389

Reservoir Properties

1. Estimated Original Reservoir Pressure, psi	1,450
2. Estimated Reservoir Pressure, 1-1-67, psi	500
3. Average Rock Properties	
Porosity, Percent	15.4
Permeability (Air), Millidarcies	8.9
4. Reservoir Saturation	
Initial Water, Percent	37
Initial Reservoir Oil, Percent	63
Reservoir Oil Percent, 1-1-67	48.2
Residual Reservoir Oil, Percent (Swept Volume)	30
5. Reservoir Oil Properties	
Estimated Bubble Point Pressure, psi	1,450
Initial Formation Volume Factor	1.230
Waterflood Formation Volume Factor	1.133
Initial Solution GOR, CF/B	499
Initial Oil Viscosity, cp	1.18
API Gravity, Crude	37
6. Estimated Original Stock Tank Oil in Place	
Barrels	8,784,600
Barrels per Acre-Foot	612

Reserves Estimates

1. Estimated Ultimate Primary Recovery, Bbls.	1,627,403
2. Estimated Remaining Primary, 1-1-67, Bbls.	120,000
3. Primary Recovery, Percent of ST Oil in Place 1-1-67	17.1
4. Estimated Waterflood Volumetric Sweep Efficiency	0.55
5. Estimated Waterflood Recovery	
Barrels ST Oil	1,090,000
Barrels ST Oil Per Acre Foot	105
Percent of Initial STO In Place	17.1
6. Estimated Secondary Recovery, ST Bbls. Oil	970,000



-LEGEND-

- Central Tank Battery
- Water Injection Plant
- Injection Well
- Injection Well To Be Drilled
- Unit Boundary

Only Eumont Yates, Seven Rivers, Queen (Oil)
and Eumont Queen (Gas) Wells Shown

CONTINENTAL OIL COMPANY

PRODUCTION DEPARTMENT

NOBBS DISTRICT

EUMONT YATES, SEVEN RIVERS,

QUEEN OIL POOL

Lee County, New Mexico

REED-SANDERSON UNIT

ENCL. NO. 6

CONTINENTAL OIL COMPANY
PRODUCTION RESEARCH DIVISION
WATER ANALYSIS REPORT

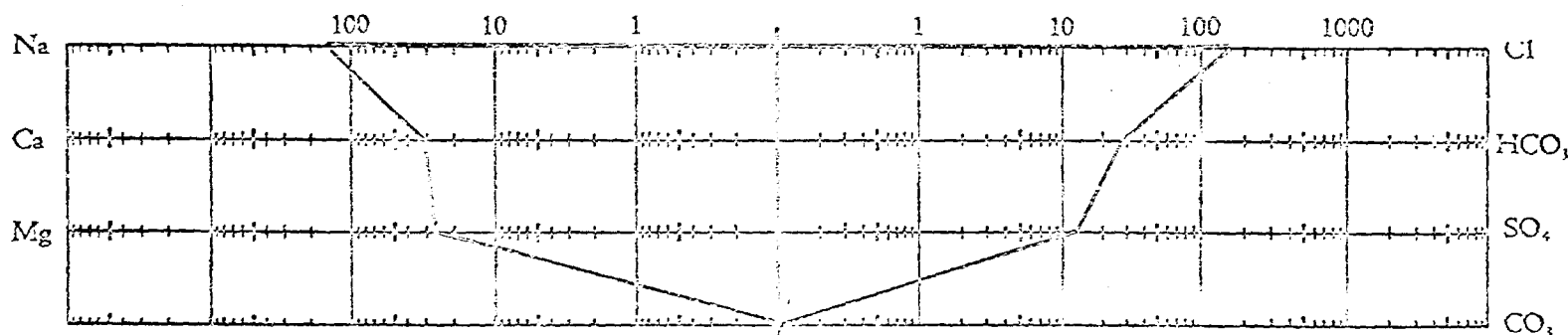
MADE TO ORDER

Company Continental Oil Company Date March 1, 1966 No. W-6622
Well E-M-F SWD-I No. 1 Location
Field E-M-F SWD System Formation Mixture
State New Mexico County Lea Depth
Sample Source Wellhead Date Collected January 29, 1966

Specific Gravity 1.009 Resistivity at 73 °F .550 ohm Meters pH 7.2

	meq/L	mg/L (ppm)		meq/L	mg/L (ppm)
Total Dissolved Salts		<u>12,800</u>	Sodium (Na)	<u>153.54</u>	<u>3,530</u>
Hydrogen Sulfide		<u>330</u>	Magnesium (Mg)	<u>25.41</u>	<u>305</u>
Chlorides (Cl)	<u>166.11</u>	<u>5,890</u>	Calcium (Ca)	<u>30.40</u>	<u>608</u>
Sulfates (SO ₄)	<u>13.75</u>	<u>660</u>	Ba		<u>0</u>
Carbonates (CO ₃)		<u>0</u>	Iron (mg/L) Total	<u>0</u>	Dissolved <u>0</u>
Bicarbonates (HCO ₃)	<u>29.18</u>	<u>1,780</u>	Suspended Solids		<u>23</u>
Free Hydroxyl (OH)					

WATER ANALYSIS PATTERN
SCALE MEQ/LITER



Remarks: Sample No. 1 - Analysis for use in Reed-Sanderson Unit waterflood

B. M. Casad
B. M. Casad
Supervisor
Production Chemistry Group



CONTINENTAL OIL COMPANY

P. O. BOX 460
HOBBS, NEW MEXICO

September 21, 1966

PRODUCTION DEPARTMENT
HOBBS DISTRICT
L. P. THOMPSON
DISTRICT MANAGER
G. C. JAMIESON
ASSISTANT DISTRICT MANAGER

1001 NORTH TURNER
TELEPHONE: EX 3-4141

*File Case
3464*

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

Attention of Mr. A. L. Porter, Jr., Secretary-Director

Re: Approval of Reed-Sanderson
Unit and Waterflood

Gentlemen:

My letter of August 26, 1966, forwarded three copies of our application for approval of the Reed-Sanderson Unit Agreement and Waterflood project. Mr. Frank Irby of the State Engineer's office called to our attention that there was an inconsistency on the information shown on Exhibit 4 as compared to that shown on Exhibit 4-13. Upon checking we find that Exhibit 4-13 was in error in regard to the amount of cement used for the surface casing on the Two States' Etcheverry No. 1. Consequently, I am forwarding herewith a corrected copy of Exhibit 4-13.

I sincerely appreciate Mr. Irby's calling this error to our attention and I am pleased to submit the correct exhibit at this time. Please substitute this exhibit for the one previously furnished you with the application.

Yours very truly,

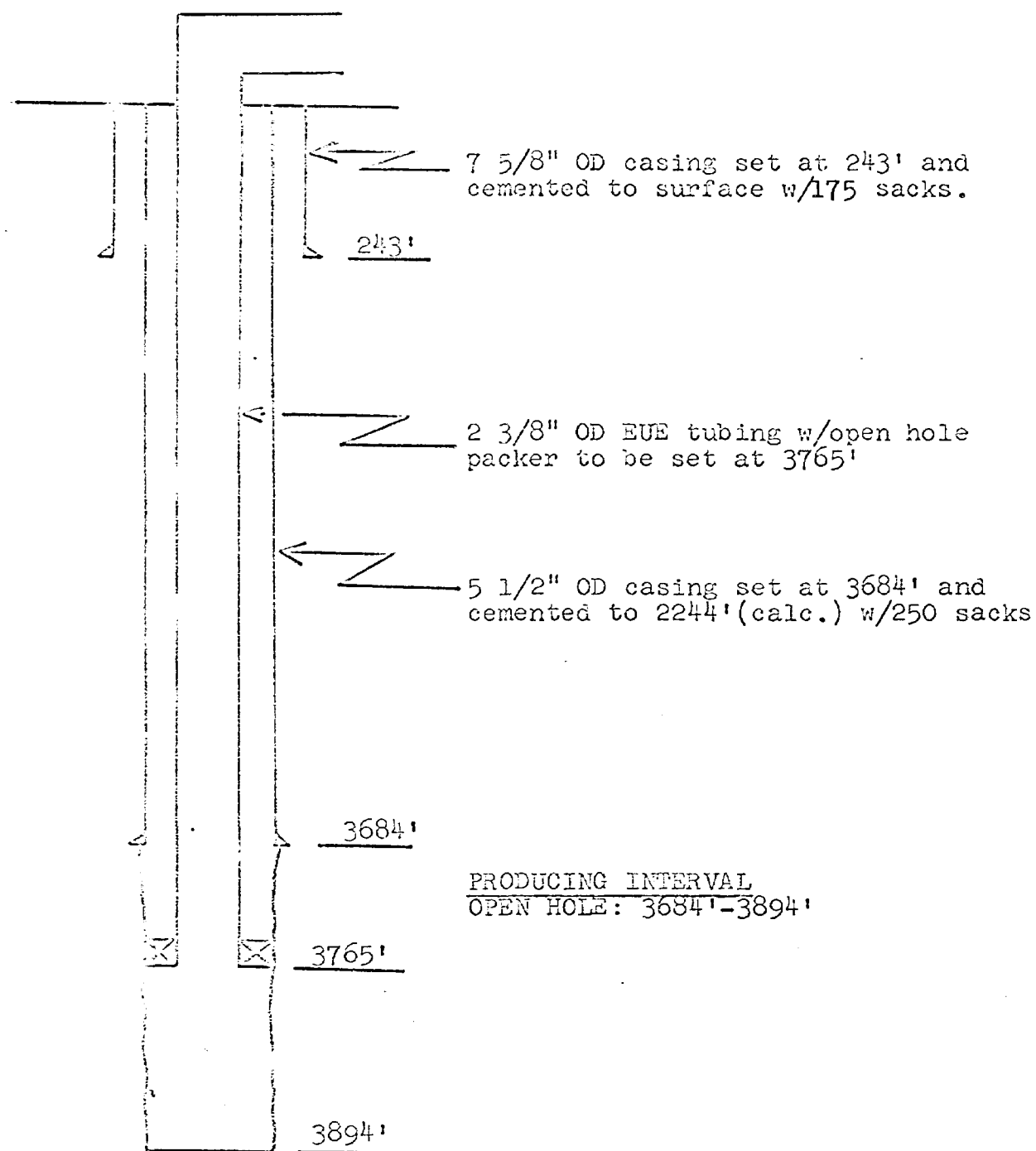
V. T. LYON

VTL-JS
cc: State Engineer
Capitol Building
Santa Fe, New Mexico

RGP GW JWK

WATER INJECTION WELL DATA

Two States
Etcheverry No. 1
2310' FNL & 1650' FNL Sec. 10-20-36
Elev.: BHP - 3590'
DF - 3600'

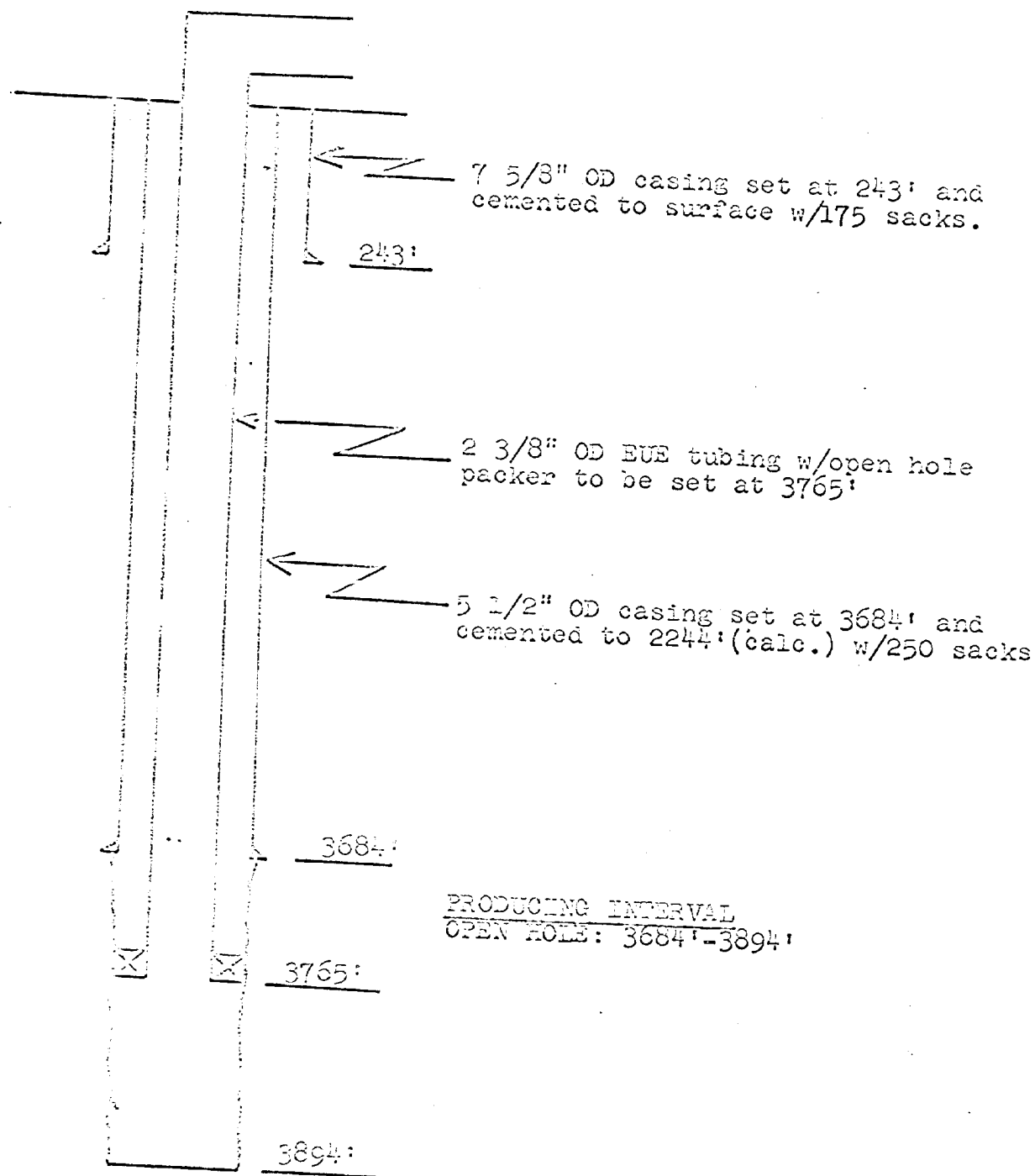


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3894'.
2. Run tubing with open hole packer to be set at approximately 3765' (-165').
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Two States
Etcheverry No. 1
2310' FNL & 1650' FEL Sec. 10-20-36
Elev.: BHF - 3590'
DF - 3600'

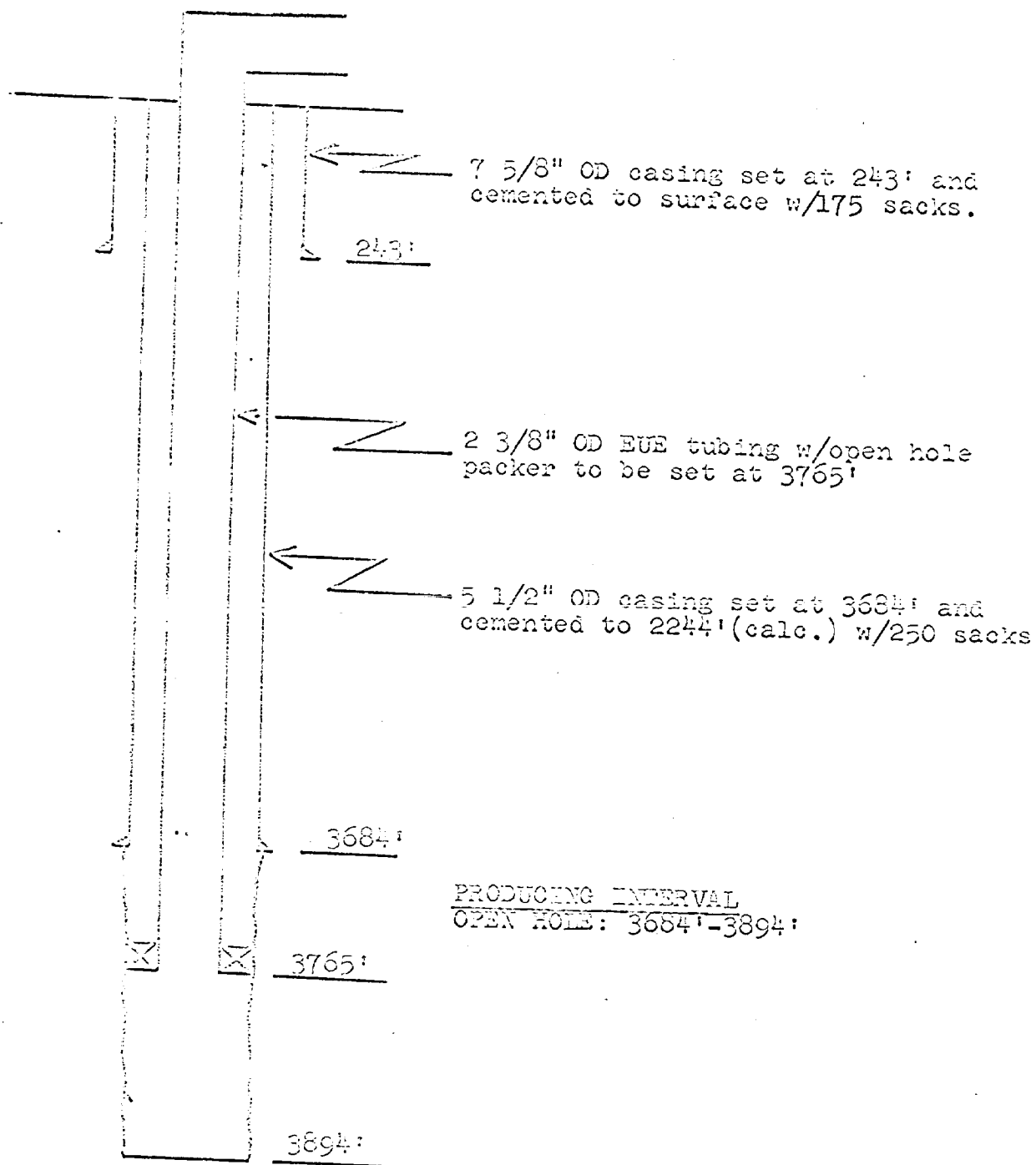


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3894'.
2. Run tubing with open hole packer to be set at approximately 3765' (-165').
3. Connect up well for injection down the tubing.

WATER INFUSION WELL DATA

Two States
Etcheverry No. 1
2310' FNL & 1650' FEL Sec. 10-20-36
Elev.: BHP - 3590'
DP - 3600'



PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3894'.
2. Run tubing with open hole packer to be set at approximately 3765' (-165').
3. Connect up well for injection down the tubing.

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

October 4, 1966

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Re: Case No. 3464
Order No. R-3131
Applicant:
Continental Oil Company

Dear Sir:

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

Very truly yours,

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

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC

Other Mr. Frank Irby



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

September 27, 1966

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

Case 3464

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

Dear Mr. Porter:

Reference is made to the application of Continental Oil Company dated September 22, 1966 which seeks approval of the Reed-Sanderson Unit Agreement and approval to install and operate a waterflood within the boundaries of said unit.

I have reviewed the application and the exhibits submitted therewith and presented questions to Continental's attorney, Jason Kellahin, concerning the completion of the well shown on Exhibit 4-13. In answer to my questions, Mr. V. T. Lyon addressed a letter to his attorney, Mr. Kellahin on September 21, 1966 explaining their plan of completion on this specific well and their plan to remedy any problems resulting from the plan set forth, and also stated that the surface casing was circulated by use of 175 sacks rather than 250 sacks shown on the original Exhibit 4-13.

Having reviewed the application and exhibits attached thereto and Mr. Lyon's letter above referred to, this office offers no objection to the granting of the application, provided a copy of Mr. Lyon's letter is made a part of the record. By telecon I have discussed this with Mr. Kellahin and he has agreed to enter a copy of Mr. Lyon's letter into the record.

FEI/ma
cc-Jason Kellahin
V. T. Lyon
F. H. Hennighausen

Yours truly,

S. E. Reynolds
State Engineer

By: *Frank E. Irby*
Frank E. Irby, Chief
Water Rights Division



CONTINENTAL OIL COMPANY

P. O. BOX 460
HOBBS, NEW MEXICO

PRODUCTION DEPARTMENT
HOBBS DISTRICT
L. P. THOMPSON
DISTRICT MANAGER
G. C. JAMESON
ASSISTANT DISTRICT MANAGER

1001 NORTH TURNER
TELEPHONE: EX 3-4141

September 21, 1966

Mr. J. W. Kellahin
54 1/2 San Francisco
Santa Fe, New Mexico

Dear Mr. Kellahin:

Thank you for your letter dated September 16, 1966, calling to my attention the questions raised by Mr. Frank Irby. I have verified that the information shown on Exhibit 4 is correct and have furnished corrected copies of Exhibit 4-13 to those parties receiving the application.

I can understand Mr. Irby's concern about the open hole packer which is proposed to be used in the Two States' Etcheverry well. Actually we do not, at this time, expect to use this well for injection purposes. Two States has informed us informally that they do not expect to commit this tract to the unit. Since their wells are classified as Eumont oil wells, we do not consider it wise to leave them out of the unit area. Since the lease is to be included in the unit area, it also appears logical to treat the injection pattern as it would be if the lease were committed. Therefore, although we do not expect to use the well, we should clarify the record as to this situation since it is a part of our case.

In converting the Two States Etcheverry No. 1 for injection purposes, it will be necessary to caliper the well bore in an attempt to establish a packer seat. The packer is desirable in order to isolate zones which we consider to be gas productive. Assuming that a suitable packer seat can be found, subsequent tracer surveys will

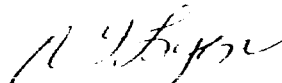
Mr. J. W. Kellahin
Page 2

indicate if fluid is by-passing the packer. Should a suitable packer seat not be found or if fluid is found to be by-passing the packer, it will be necessary that we evaluate whether the loss of water to the gas zone is sufficiently injurious to our injection program to justify remedial action. Remedial action would involve either selecting an alternate packer seat which would prevent fluid by-pass or setting and cementing a liner and then perforating the intervals into which we desire to inject water.

There is no reason to believe that water injected into the open hole portion would channel behind the casing to formations above the casing seat; therefore, it is believed that this will constitute no greater hazard to formations other than the unitized formation, than do the other injection wells.

Please express my sincere gratitude to Mr. Irby for calling these matters to our attention prior to the hearing and inform him that we shall be happy to give him any further information that he desires.

Yours very truly,



V. T. LYON

VTI-JS

RGF GW

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, President

1201 (4-60)

SYMBOLS

DL=Day Letter

NL=Night Letter

LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME

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1966 SEP 27 PM 3 50

NEW MEXICO OIL CONSERVATION COMMISSION=

MAIN OFFICE

STATE LAND OFFICE BLDG SANTA FE NMEX=

'66 SEP 27 PM 3 48

CC: CONTINENTAL OIL COMPANY

HOBBS, NEW MEXICO

ATTENTION: MR A L PORTER, JR., SECRETARY AND

DIRECTOR

IN RE CASE 3463 AND CASE 3464, APPLICATIONS OF
CONTINENTAL OIL COMPANY FOR APPROVAL OF THE REED =
SANDERSON UNIT AGREEMENT AND FOR PERMISSION TO INSTALL
AND OPERATE A WATERFLOOD WITHIN SAID UNIT IN LEA

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

COUNTY, NEW MEIXCO. STANDARD OIL COMPANY OF TEXAS IS
A MAJOR WORKING INTEREST OWNER IN THE PROPOSED UNIT
AND HEREBY CONCURS WITH CONTINENTAL'S APPLICATIONS=
STANDARD OIL CO OF TEXAS PAUL HULL=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

dearnley-meier reporting service, inc.

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

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-4491 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 28, 1966

EXAMINER HEARING

IN THE MATTER OF:

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

Case No. 3463

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

Case No. 3464

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING



MR. UTZ: Case 3463.

MR. HATCH: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, we propose that Case 3463 and 3464 be consolidated for the purpose of making a record, with separate orders to be entered.

MR. UTZ: Case 3463 and 64 will be consolidated for the purposes of hearing. Separate orders will be written.

MR. KELLAHIN: We have two witnesses I would like to have sworn, please.

(Witnesses sworn.)

MR. KELLAHIN: I call as our first witness Mr. Victor T. Lyon.

(Whereupon, Continental's Exhibits 1 through 9 were marked for identification.)

VICTOR T. LYON

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Victor T. Lyon.

Q By whom are you employed and in what position, Mr. Lyon?

A I am employed by Continental Oil Company as supervising engineer in the Hobbs District Office, Hobbs, New Mexico.

Q Have you testified before the Oil Conservation Commission and made your qualifications a matter of record?

A Yes, sir.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. UTZ: He is qualified.

Q (By Mr. Kellahin) Are you familiar with the application of Continental Oil Company in Cases 3463 and 3464?

A I am.

Q Briefly, what's proposed by these applications?

A Consolidated Cases 3463 and 3464 are the application of Continental Oil Company for the approval of Reed-Sanderson Unit Agreement and for a waterflood project for that unit.

Q Referring to what has been marked as Exhibit No. 1, would you identify that exhibit, please?

A Yes, sir. Exhibit No. 1 is the Unit Agreement which we propose to use for this unit. It is of a modified federal form and has attached to it two exhibits; one is Exhibit A, being a plat showing the unit area in a brown line and the location of wells, the identification of leases,

by the usual symbols. It also shows the designation of the tracts and their numbers for cross reference with Exhibit B, which is a list of the leases and a description of the ownership in each lease.

Q What does the unit area consist of?

A The unit area, as shown on Exhibit A, and as described in Section 2, is as follows: In Township 20 South, Range 36 East, Section 3, the West Half and West Half of the East Half; in Section 4 the East Half of the East Half; in Section 9 the East Half of the Northeast Quarter, and in Section 10, Northwest Quarter, West Half of the Northeast Quarter, Northeast Quarter of the Southwest Quarter and Northwest Quarter of the Southeast Quarter, being a total of 1040.83 acres, more or less.

Q What percentage of the unit area is Federal and what percentage State and what percentage Fee?

A There are five Federal tracts containing 680.83 acres, which is 65.41% of the unit area. There are five Fee tracts containing 360 acres, or 34.59% of the unit area.

Q Then there is no State acreage in the unit, is that correct?

A That is correct.

Q What is the unitized formation?

A The unitized formation is the Queen formation,

which is defined in Section 2, Paragraph (g) of the Unit Agreement and is shown on the radioactivity log of Continental Oil Company's Reed A-3 Well No. 15 located 1980 feet from the South Line and 2310 feet from the East Line of Section 3, between the depth of 3557 and 3968. This log is shown as Exhibit 3 in the little booklet here.

Q Now, what is the basis for tract participation in the unit?

A The participation formula is based 40% on production between the dates of January 1st, 1964 and November 1st, 1964, 30% on remaining primary reserves after November 1st, 1964, and 30% on the estimated ultimate recovery for each tract.

Q Do you have an exhibit which shows these parameters for each of the tracts?

A Yes. Exhibit 1-1 which immediately follows Exhibit B, attached to Exhibit 1, shows tabulated the information which provides the participation and the total participation of each tract.

Q Would you describe the salient points that are covered by this Unit Agreement?

A Yes, sir. Section 4 provides the procedure for expanding the unit area; Section 6 designates Continental Oil Company as the operator; Sections 7 and 8 provide the

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CONVENTIONS

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ALBUQUERQUE, NEW MEXICO

PHONE 243-6891

P.O. BOX 1092

ALBUQUERQUE, NEW MEXICO

PHONE 256-1294

1120 SIMMS BLDG.

1203 FIRST NATIONAL BANK EAST

PAGE

6

procedure for resignation or removal of operator and election of a successor operator. Section 13 describes the basis of participation. Section 14 provides the manner of qualifying a tract for unit participation. Section 16 provides for the settlement of royalties. Section 24 provides for the effective date and term; the effective date is the first day of the month following the commitment of 85% of the unit area by working interest owners, the approval of the Director of the U.S.G.S. and the Oil Conservation Commission and the filing of a counterpart of this agreement for record in the office of the County Clerk of Lea County, New Mexico.

Q Has this Unit Agreement been submitted to the Department of Interior?

A Yes. Preliminary approval was received by a letter from the U.S.G.S. dated April 29th, 1966.

Q What percentage of the owners have executed the agreement at this time?

A As of this date, 87.3% of the working interest ownership, 60% of the royalty ownership, and 99 plus percent of the overriding royalty ownership have executed or ratified the agreement.

I might add at this point that the U.S.G.S., on this particular unit, has required that the lessees of record

under Federal tracts be treated the same as royalty owners, and because these are old leases, we have had some difficulty in reaching the original lessees or their heirs, and if you include the lessees of record under the Federal tracts with the royalty owners, then our ratification by royalty owners is reduced to about 30%.

Q Do you anticipate you will get the other royalty owners signed, or a substantial portion of them?

A Yes, I think we should have very little problem.

Q Do you anticipate any difficulty in getting the hundred percent of the working interest ownership signed up?

A We have been told at least tentatively by Two States Oil Company, which is the operator of Tract 8, that they do not intend to commit their lease to the unit at this time.

Q Do you have a provision in the Unit Agreement for subsequent joinder?

A Yes, sir.

Q So they could joint at a later date if they elect to do so?

A That is correct.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibit No. 1, being a copy of the proposed Unit Agreement.

MR. UTZ: Without objection, Exhibit No. 1 will be entered into the record.

(Whereupon, Continental's Exhibit No. 1 was offered and admitted in evidence.)

MR. KELLAHIN: That's all I have on direct examination of this witness.

MR. UTZ: Questions? No questions. Statements?

MR. KELLAHIN: I have another witness.

MR. UTZ: The witness may be excused.

(Witness excused.)

MR. KELLAHIN: I would like to call Mr. J. P. Boylar.

MR. UTZ: Did Two States say anything about flooding, are they going to flood the two wells they have down in the 80 acres or are they going to let them sit there?

MR. LYON: They are just going to let them sit there.

MR. UTZ: They'll be coming in for capacity allowables, won't they?

MR. LYON: I might point out that their wells have a high gas-oil ratio and they don't want to jeopardize their gas revenue.

MR. UTZ: I see. You may proceed.

J. P. BOYLAN

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A J. P. Boylan.

Q By whom are you employed and in what position, Mr. Boylan?

A I am employed by Continental Oil Company as a senior engineer in the Hobbs District Office, Hobbs, New Mexico.

Q Have you ever testified before the Oil Conservation Commission or its Examiner and made your qualifications a matter of record?

A Yes, I have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. UTZ: Yes, sir, he's qualified.

Q (By Mr. Kellahin) You heard the testimony of Mr. V. T. Lyon in regard to the Reed-Sanderson Unit Agreement. What is the purpose of this proposed unit?

A This unit is being formed for the purpose of conducting waterflood operations in the unit area.

Q Now, referring to what has been marked as Exhibit No. 2, would you identify that exhibit and discuss the information shown?

A Exhibit No. 2 is identified as Exhibit No. 2 in the exhibit package. This exhibit is a plat of the Reed-Sanderson Unit area and an area two miles in each direction from the unit boundary. Lease ownership and location and identification of wells are shown in the usual manner. The formation from which each well is producing is shown by letter and color symbol which is explained in the legend. The unit area is shown within the broken line which depicts the unit boundary. The boundary of the Northwest Eumont Unit, operated by Gulf Oil Corporation, and which joins the proposed Reed-Sanderson Unit to the north, is shown by a dashed line.

Q Now, referring to what has been marked as Exhibit No. 3, would you describe the information shown on that exhibit?

A Exhibit No. 3 is a copy of the radioactivity log run on Continental's Reed A-3 No. 15. As stated by Mr. Lyon, this is the type log identifying the unitized formation. The log shows by a horizontal red line the top of the Queen Formation at a depth of 3557. In a similar manner, the top of the Grayburg, which is also the base of the Queen Formation, is shown at 3968 feet. The vertical interval between these

two depths is the unitized formation. The pay in this area is the unitized formation, namely the Queen and Lower Queen-Penrose Formation. The Yates and Seven Rivers Formations are not considered to be oil-production and are cased off in all of the unit wells.

Q Now, referring to the group of exhibits designated as 4 through 4-13, would you comment on these?

A Exhibit 4 and Exhibits 4-1 through 4-13 were attached to the application as required by Rule 701, and consequently have been designated in that sequence. For the purpose of my testimony I would prefer to discuss them later in the hearing.

Q Would you give a brief history of the Reed-Sanderson Unit Area?

A During the late 1930's the Queen pay in the unit area was developed by two wells on the Two States' Etcheverry lease, and by Continental's Reed A-3 No. 5. These wells were classified as Monument Grayburg-San Andres Pool wells until 1953 when the Etcheverry wells were reclassified as Eumong wells with the creation of the Eumont Gas Pool.

The H. L. Moss, Reed No. 1 was drilled and completed in 1953. Continental's development on the Argo, Argo-Leonard, Hewes, Leonard, Reed A-3, Sanderson B-1, Sanderson B-4, Sanderson B-9 and Walker leases did not

commence until 1955. The three older wells were completed open-hole and were either acidized or shot. The more recently drilled wells were cased through the pay section, perforated and sand fraced with treatments averaging approximately 20,000 gallons. The unit area contains 26 wells which have produced from the Eumont Oil Pool. Twenty-four of the wells are currently producing and two are abandoned. The Continental Leonard Well No. 1 was temporarily abandoned without pulling the casing. The Continental Reed A-3 Well No. 5 is permanently abandoned.

Q What is the current average daily production in the unit area?

A During the month of June 1966 the unit area averaged 124 barrels of oil per day with 70 barrels of water per day and 2.7 million cubic feet of gas per day, for an average gas-oil ratio of 21,800 cubic feet per barrel. This is an average of 5.2 barrels of oil per day per well. Maximum daily oil production from any one well during June 1966 was 14.2 barrels per day. The above producing rates indicate the reservoir is at or very near the economic limit of production.

Q By that, you mean primary production?

A That is correct.

Q What is the cumulative production within the

unit area?

A Production as of 7-1-66 for the unit area totaled 1,483,403 barrels of oil.

Q What was the reservoir drive mechanism during primary production?

A The mechanism for the Reed-Sanderson Unit is a combination of gas cap expansion and solution gas drive.

Q Now, referring to what has been marked as Exhibit No. 5, would you identify that exhibit, please?

A Exhibit No. 5, in the exhibit package under that number, is a map showing the structural configuration on the top of the Lower Queen Penrose member of the Queen Formation with a contour interval of 50 feet. Oil accumulation in the Eumont Pool is a down structure oil rim on the large Eumont Gas Pool. The Queen Formation is oil-productive below an approximate sub-sea datum of 150 feet. Wells completed near this datum have high gas-oil ratios and indicate that the gas cap is associated with the oil-bearing formation.

Q Now, does the gas-oil contact in the Queen Formation, in your opinion, limit the oil production to the east of the unit boundary?

A In my opinion, it does.

Q You stated that the Reed-Sanderson Unit is adjacent to Gulf's Northwest Eumont Unit. What limits



production to the west and south of the proposed unit area?

A The productive limit to the west is determined by a permeability pinchout in the Queen Formation on the down-dip flank of the structure. This was confirmed by a dry hole located in Unit B of Section 9, 20 South, 36 East. The productive limit to the south is also defined by two dry holes, one in Unit I of Section 9 and one in Unit O of Section 10, 20 South, 36 East.

Q Now, skipping Exhibit 6 for the moment, would you refer to Exhibit No. 7 and describe the information shown on it?

A Exhibit No. 7 is a cross section showing the logs, reading from left to right, of Continental Oil Company's Reed A-3 No. 15, Continental Oil Company Reed A-3 No. 5, and H. S. Moss, J. L. Reed No. 1. Lines have been drawn from well to well showing the correlations of the tops of the Yates, Seven Rivers, Queen, Lower Queen Penrose and Grayburg Formations. The perforations are shown on Reed A-3 No. 13 and the open-hole interval on the other two wells is shown to be within the Lower Queen Penrose section, except for a very small interval approximately 15 feet in the Reed A-3 No. 5, which appears to have penetrated the Grayburg Formation. In my opinion a very high percentage, if not all, of the production from this well was produced from that

section, which we propose to unitize in the Reed-Sanderson Unit.

Q Are all of these wells presently classified as producing or having produced from the Eumont Pool?

A No, sir. Continental Oil Company Reed A-3 No. 5 and H. S. Moss, J. L. Reed No. 1 are both presently classified in the Monument Grayburg-San Andres Pool.

Q In your opinion, is this classification correct?

A In my opinion this well would be more correctly classified as a Eumont Pool well since the bulk of its production was undoubtedly produced from that interval. In regard to the H. S. Moss well, I believe that the Commission was in error in continuing its classification as a Monument Grayburg-San Andres well.

Q Has this information and your recommendation been communicated to the Oil Conservation Commission?

A Not at this time, however, it will be when we return to Hobbs.

Q The information has already been given to the geologist at Hobbs, has it not, Mr. Boylan?

A The information is prepared but it has not yet been submitted to the geologist.

Q What is your recommendation in regard to these two wells?

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A It is my recommendation that for record purposes the Reed A-3 No. 5 be reclassified to the Eumont Pool and its cumulative production transferred from the Monument Pool to the Eumont Pool. In regard to the H. S. Moss, Reed No. 1, it is my recommendation that well be transferred to the Eumont Pool from the Monument Pool, both as to record purposes and as to current regulation purposes.

Q Now, referring back to what has been marked as Exhibit No. 6, would you identify that exhibit and discuss it?

A Exhibit No. 6 is in the exhibit package under the same number, and it is a tabulation of data in regard to the reservoir rock, fluid characteristics and estimated waterflood performance.

Q Now, in your opinion, is waterflooding feasible in the Reed-Sanderson Unit?

A Yes. After reviewing the available data in regard to porosity, permeability, oil saturation, oil recovery under primary operations, and calculations by accepted methods as to anticipated performance under waterflooding, my opinion is that the unit area can be successfully and economically waterflooded.

Q Will waterflooding of the unit area result in the recovery of oil that would not otherwise be recovered?

A Yes, sir. It is estimated that approximately

970,000 barrels of oil will be recovered by waterflooding, which would not be recovered otherwise.

Q A while ago we passed up a discussion of Exhibit 4 and 4-1 through 13. Would you refer to those exhibits and discuss them, please?

A Exhibit No. 4 is a tabulation of the wells which are proposed to be converted for water injection. The size and setting depth of each casing string, the amount of cement used and the interval open to the formation is shown for each well. The footage location of each well is also shown.

Exhibits 4-1 through 4-13 are schematic diagrams for each well showing the same information as that tabulated on Exhibit No. 4.

Q Now, in each case, Mr. Boylan, do you propose to inject through tubing under a packer?

A That is correct.

Q Will the tubing be coated?

A Yes, sir, it will be.

Q Will you use an inert fluid of any kind in the annulus, or do you know at this time?

A The annulus will be filled with fresh water to the best of my knowledge.

Q Now, referring to what has been marked as Exhibit No. 8, would you describe what is shown on that

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exhibit?

A Exhibit 8 is a map of the unit area showing the proposed waterflood pattern. The injection wells are shown by the usual triangular symbol. The injection wells are located on a normal 80-acre five-spot pattern. Exhibit No. 8 also shows the proposed location of the central bank battery and the location of the water injection plant. Continental's Reed A-3 Well No. 7 and Sanderson B-4 Well No. 1 will offset injection wells across the lease line in the Northwest Eumont Unit. Since Continental's Reed A-3 No. 5 was permanently plugged and abandoned, it is proposed to drill a replacement water injection well, Reed A-3 Well No. 16, to be located 1980 feet from the North and East Lines of Section 3, 20 South 36 East.

Q Now, in the operation of this waterflood, do you anticipate any interference with the up-dip gas completions as a result of injecting water into the adjacent injection wells?

A I do not anticipate water breakthrough into the gas well completions. You will note that the Queen Formation in the type well is 411 feet thick. The Reed A-3 Well No. 2 gas well completion occurs in the top 210 feet of the Queen Formation, while the proposed completion in Reed A-3 Well No. 16 will be in the bottom 70 feet of the Queen

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Formation. This leaves a vertical stratigraphic interval of approximately 130 feet between the two completions as well as 1320 feet of horizontal separation. The other injection wells are more than a quarter-mile distance from the gas wells in a steeply dipping area. The bottom 70 feet of the Queen Formation is open in three unit wells offsetting the proposed Reed A-3 Well No. 16. This should cause injected fluid movement away from the gas well completion.

Q Now, you will have a central tank battery for the unit, is that correct?

A Yes, sir.

Q Will that have adequate testing facilities?

A A test facility in the central battery will permit at least one test per month of each producing well in the unit area.

Q Will the injection plant have metering facilities?

A Yes, sir. Metering facilities will permit continuous metering of the total water injected and monitoring meters will provide accurate estimates of the water injected into each individual well.

Q How much water do you anticipate will be injected in this project?

A Initially we expect to inject approximately 4500 barrels of water per day into the 13 injection wells.

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Q What is the source of your water?

A The water will be purchased from the E-M-E Salt Water Disposal System. The unit will take delivery of water from the system at a point located in the Northeast Quarter, Southeast Quarter, Section 1, 20 South, 36 East, approximately 2.1 miles to the east of the unit. Produced water from the unit area will be reinjected when the volumes are sufficient to justify its use.

Q You state that the source of the water is the E-M-E Salt Water Disposal System. Do you have an analysis of this water?

A Yes, sir. Exhibit 9 is an analysis of a representative sample of that water.

Q Is the proposed injection water supply compatible with the Queen Formation water?

A The two waters are reported to be compatible.

Q How do you propose to protect the water injection well casing against corrosion?

A As shown on Exhibits 4-1 through 4-13, water will be injected under a packer set on two-inch tubing. The tubing and surface facilities will be given a protective coating to guard against corrosion. Corrosion-resistant materials will be used where it is not practical to apply protective coating.

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Q The unit flood will be operated under the provisions of 701-E?

A Yes.

Q What do you anticipate your allowable will be?

A There are 26 wells which will be in operation, each on a 40-acre tract or lot. This number multiplied by 47 provides a current waterflood allowable of 1,222 barrels of oil per day. A higher normal unit allowable would, of course, make the allowable proportionately higher.

Q This would indicate you don't propose to set up a pilot project here, is that correct?

A No, sir. The unit area is producing at approximately the economic limit at this time. There appears to be no useful information which can be gained by installing a pilot. In the interest of efficiently flooding the unitized area, we propose to install a full scale flood.

Q In your opinion, will the granting of the application result in the protection of correlative rights and the prevention of waste?

A Yes, sir. It is well recognized that unit operations protect correlative rights and that secondary recovery operations recover additional oil which otherwise would be wasted.

Q Were Exhibits 2 through 8 prepared by you or

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under your supervision?

A Yes, sir, they were.

Q And Exhibit No. 9, I believe you stated was a water analysis prepared for Continental Oil Company, is that correct?

A Prepared for and by Continental Oil Company.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 2 through 9.

MR. UTZ: Without objection, Exhibits 2 through 9 will be entered into the record of this case.

(Whereupon, Continental's Exhibits 2 through 9 were offered and admitted in evidence.)

Q (By Mr. Kellahin) Do you have any other comments, Mr. Boylan?

A Yes, sir. The lease line agreement with Gulf Oil Corporation, operator of the Northwest Eumont Unit, has not yet been negotiated. Also, it is not certain that all tracts within the unit area will be committed to the unit agreement. Under these circumstances, it may be necessary to modify our injection pattern from that which is proposed at this hearing. In view of this fact, it is requested that the order contain provisions which will permit administrative approval of injection wells other than those which are proposed at this time. Such a procedure would permit modifications without

the necessity of additional hearings.

MR. KELLAHIN: That's all I have on direct examination, Mr. Utz.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Boylan, in view of the fact that Two States is not coming into the unit, do we still want approval on the Two States' Well No. 1, that Etcheverry No. 1?

A Mr. Lyon, correct me if I am in error, but I believe at this time their final decision is not made. In other words, we have written the plan assuming that they will come into the unit. If they do not come into the unit, it doesn't modify the over-all plan appreciably. We merely did not convert that well to injection.

MR. LYON: Mr. Utz, may I answer that question, please? Two States has told us that they do not intend to join the unit. However, since those wells are Eumont wells, we thought that it was proper to leave the tract in the unit area, and it has happened before that people have changed their minds, and rather than come back here for another hearing in the event they do commit their tract to the Unit Agreement, we would like to have it included in the order at this time so that should that eventually come to pass, that we could proceed.

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A If I may add, if we had administrative approval to convert it to injection, I don't believe it would be necessary to include it in the order at this time.

Q (By Mr. Utz) Well, that's what I thought. I don't know that it makes too much difference either way. What were the two Eumont gas wells that were reclassified?

A I was not referring to Eumong gas wells. I was referring to H. L. Moss, Reed No. 1.

Q What's the location?

A It's located in the Northwest Quarter of the Northeast Quarter of Section 3, 20 South, 36 East. It's presently designated as a Monument Grayburg-San Andres Pool well, and as shown on Exhibit No. 7, the cross section, in my opinion it is currently producing from the Eumont-Queen Pool.

Q You had one more in that category.

A The other well is Continental's Reed A-3 No. 5, located in the Southwest Quarter, Northeast Quarter, Section 3, 20 South, 36 East. However, this well has been permanently plugged and abandoned at this time.

Q That's the one that's marked in ink on your Exhibit No. 2, right?

A Yes, sir, that is correct.

Q But the Reed No. 1 is still producing?

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A I don't understand your question.

Q The Reed No. 1, the H. L. Moss, Reed No. 1, is still producing?

A Yes, it is currently still producing.

Q And you intend to make an injection well out of it?

A No, sir. In the pattern shown on Exhibit 8, the Moss, Reed No. 1 will be a producing well.

Q Well, I was looking at Exhibit No. 2, and the red circles mean different things there. But it's your recommendation that that well be considered as a Eumont gas well?

A No, sir, that is not correct, it's a Eumont oil well. Let me refer again to --

Q It's less than a hundred thousand to one GOR?

A I can't answer that exactly, but I believe it is, yes, sir. It had an initial completion ratio of 4,350 cubic feet per barrel, as noted on Exhibit 7, the cross section. This was an initial gas-oil ratio.

Q Then there are no gas wells in this unit?

A There are no gas wells within the unit boundary, no, sir. As shown on Exhibit No. 8, there are gas wells adjacent to the unit boundary in Section 3, they're indicated by numbers two and three on the right side of the section adjacent to the unit boundary.

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MR. UTZ: Are there any other questions of the witness? The locations as shown on your Exhibit No. 4 are accurate to the best of your knowledge?

A Yes, sir, they are.

MR. UTZ: The witness may be excused.

(Witness excused.)

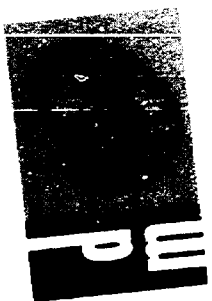
MR. UTZ: Any statements?

MR. KELLAHIN: If the Examiner please, Mr. Frank Irby called me prior to the hearing and said he would be unable to be here, but he asked that I put in the record a copy of a letter addressed to me from Mr. V. T. Lyon. I have a copy of that letter here.

MR. HATCH: There is a letter from the State Engineer's Office concerning the application. It says: "Having reviewed the application and exhibits attached thereto, and Lyon's letter, this office does not object to the application providing a copy of Mr. Lyon's letter is made a part of the record.

MR. UTZ: Both this letter referred to and the letter from V. T. Lyon to Jason Kellahin will be made a part of the record. Any other statements? The case will be taken under advisement and we will take a ten-minute break.

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STATE OF NEW MEXICO)
) SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 24th day of October, 1966.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:
June 19, 1967.

I do hereby certify that the foregoing is a true and correct record of the proceedings in the final hearing of Case No. 3463-67 heard by me on Sept. 28, 1966.
Thos. L. J. [Signature], Examiner
New Mexico Oil Conservation Commission

UNIT AGREEMENT

REED-SANDERSON UNIT

LEA COUNTY, NEW MEXICO

BEFORE EXAMINER UTZ	
CIL CONSERVATION COMMISSION	
<i>Appl</i>	EXHIBIT NO. <i>1-9</i>
CASE NO.	<i>3463-3464</i>

6-21-66

UNIT AGREEMENT
FOR THE DEVELOPMENT AND OPERATION OF THE
REED-SANDERSON UNIT
DEA COUNTY, NEW MEXICO

NO. _____

THIS AGREEMENT, entered into as of the 27th day of July, 1966, by and between the parties subscribing, ratifying or consenting hereto, and herein referred to as "parties hereto";

WITNESSETH: That,

WHEREAS, the parties hereto are the owners of working, royalty or other oil or gas interest in the Unit Area subject to this Agreement; and

WHEREAS, the Oil Conservation Commission of the State of New Mexico is authorized by law (Chap. 72, Laws of 1935, as amended by Chap. 193, Laws of 1937, Chap. 166, Laws of 1941, and Chap. 168, Laws of 1949, Chap. 65, Art. 3, Sec. 14, N.M.S., 1953 anno) to approve this Agreement, and the conservation provisions hereof; and

WHEREAS, the Mineral Leasing Act of February 25, 1920, 41 Stat. 437, as amended, 30 U.S.C. Sections 181 et seq., authorizes Federal lessees and their representatives to unite with each other, or jointly or separately with others, in collectively adopting and operating a cooperative or unit plan of development or operation of any oil or gas pool, field or like area, or any part thereof for the purpose of more properly conserving the natural resources thereof whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest; and

WHEREAS, the parties hereto hold sufficient interests in the Reed-Sanderson Unit Area covering the land hereinafter described to give reasonably effective control of operation therein; and

WHEREAS, it is the purpose of the parties hereto to enable institution and consummation of secondary recovery operations, conserve natural resources, prevent waste and secure the other benefits obtainable through development and operation of the area subject to this Agreement under the terms, conditions, and limitations herein set forth;

NOW, THEREFORE, in consideration of the premises and the promises herein contained, the parties hereto commit to this Agreement their entire respective interests in the below-defined Unit Area, and agree severally among themselves as follows:

SECTION 1. ENABLING ACT AND REGULATIONS. The Mineral Leasing Act of February 25, 1920, as amended, supra, and all valid pertinent regulations, including operating and unit plan regulations, theretofore issued thereunder and valid pertinent and reasonable regulations hereafter issued thereunder are accepted and made a part of this Agreement as to Federal lands, provided such regulations are not inconsistent with the terms of this Agreement; and as to Non-Federal lands, the oil and gas operating regulations in effect as of the effective date hereof governing drilling and producing operations, not inconsistent with the terms hereof or the laws of the State in which the Non-Federal land is located, are hereby accepted and made a part of this Agreement.

SECTION 2. UNIT AREA AND DEFINITIONS. The area described by tracts in Exhibit "B" and depicted on Exhibit "A"

attached hereto is hereby designated and recognized as constituting the Unit Area, containing 1,040.83 acres, more or less, in Lea County, New Mexico. Said land is described as follows:

T-20S - R-36E

Section 3:	W/2 and W/2 E/2	480.67
Section 4:	E/2 E/2	160.16
Section 9:	E/2 NE/4	80.00
Section 10:	NW/4, W/2 NE/4 NE/4 SW/4, and NW/4 SE/4	320.00

For the purpose of this Agreement, the following terms and expressions as used herein are defined as follows:

(a) "Commission" is defined as the Oil Conservation Commission of the State of New Mexico.

(b) "Director" is defined as the Director of the United States Geological Survey.

(c) "Secretary" is defined as the Secretary of the Interior of the United States of America.

(d) "Department" is defined as the Department of the Interior of the United States of America.

(e) "Supervisor" is defined as the Oil and Gas Supervisor of the United States Geological Survey.

(f) "Unitized Formation" is defined as the Queen formation, found between the subsurface depths of 3,557 feet and 3,968 feet in the Continental Oil Company Reed "A" 3 No. 15 Well located 1980 feet from the South line and 2310 feet from the East line of Section 3, Township 20 South, Range 36 East, NMPM, as shown on the Radioactivity Log run in said well on April 7, 1958.

(g) "Unitized Substances" means all oil, gas, gaseous substances, sulphur contained in gas, condensate, distillate and all associated and constituent liquid or liquefiable hydrocarbons within or produced from the Unitized Formation.

(h) "Tract" is defined as each parcel of land described as such and given a Tract number in Exhibit "B."

(i) "Tract Participation" is defined as that percentage of Unitized Substances produced from the Unitized Formation which is allocated to a Tract under this Agreement.

(j) "Unit Participation," of each Working Interest Owner, is defined as the sum of the percentages obtained by

multiplying such Working Interest Owner's fractional Working Interest in each tract by the Tract Participation of such Tract.

(k) "Working Interest" is defined as the right to search for, produce and acquire Unitized Substances whether held as an incident of ownership of mineral fee simple title under an oil and gas lease, or otherwise held.

(l) "Working Interest Owner" is defined as and shall mean any party hereto owning a Working Interest, including a carried working interest owner, whether by virtue of a lease, operating agreement, fee title or otherwise, whose interest is chargeable with and obligated to pay or bear, either in cash or out of production, or otherwise, all or a portion of the cost of drilling, developing and producing the Unitized Substances from the Unitized Formation and operating therefor hereunder. Any interest in Unitized Substances which is a Working Interest as of the date the owner thereof executes or ratifies this agreement shall thereafter be treated as a Working Interest for all purposes of this agreement.

(m) "Royalty Interest" or "Royalty" is defined as any interest other than a Working Interest in or right to receive a portion of the Unitized Substances or the proceeds thereof and includes the royalty interest reserved by the lessor by an oil and gas lease and any overriding royalty interest, oil payment interest, or any other payment or burden which does not carry with it the right to search for and produce Unitized Substances. "Basic Royalty Interest" is defined as the royalty interest reserved by the lessor by an oil and gas lease.

(n) "Lessee of Record" is defined as the holder of record title under a United States Oil and Gas Lease.

(o) "Royalty Owner" is defined as and shall mean the owner of a Royalty Interest.

(p) "Unit Operating Agreement" is defined as and shall mean any agreement or agreements (whether one or more) entered into (separately or collectively) by and between the Unit Operator and the Working Interest Owners as provided in Section 9, infra, and shall be styled "Unit Operating Agreement, Reed-Sanderson Unit, Lea County, New Mexico."

(q) "Paying Quantities" is defined as production of Unitized Substances in quantities sufficient to pay for the cost of producing same from wells on the unitized land.

(r) "Production during the period January 1, 1964 through November 1, 1964" is defined as the barrels of oil produced during said period from the Tracts in the Unit Area as reported to the New Mexico Oil Conservation Commission on Form C-115.

(s) "Remaining Primary Recovery" is defined as the estimated remaining recoverable oil reserves under primary recovery operations, expressed in barrels, as estimated by the Reed-Sanderson Unit Engineering Subcommittee, and set forth on the Schedule of Participation Parameters prepared by said Subcommittee.

(t) "Ultimate Primary Recovery" is defined as the estimated ultimate recoverable oil from inception of production to the economic limit of production under primary operations, expressed in barrels, as determined by the Reed-Sanderson Unit Engineering Subcommittee and tabulated on the Schedule of Participation Parameters prepared by said Subcommittee.

SECTION 3. EXHIBITS. Exhibit "A" attached hereto is a map showing the Unit Area and, to the extent known to the Unit Operator, the boundaries and identity of Tracts and leases in said Unit Area. Exhibit "B" attached hereto is a schedule showing, to the extent known to the Unit Operator, the acreage comprising each Tract, percentage ownership of each Working Interest Owner in each Tract, the Lessee of Record in each Tract, and the percentage of participation each Tract has in the Unit Area, together with the Royalty Interests in each Tract and the ownership thereof. Nothing herein or in said schedule or map shall be construed as a representation by any party hereto as to the ownership of any interest other than such interest or interests as are shown in said map or schedule as owned by such party.

Exhibits "A" and "B" shall be revised by the Unit Operator whenever changes render such revision necessary, or when requested by the Supervisor, and not less than six copies thereof shall be filed with the Supervisor.

SECTION 4. EXPANSION. The above-described Unit Area may when practicable be expanded to include therein any additional Tract or Tracts regarded as reasonably necessary or advisable for the purposes of this Agreement. Such expansion shall be effected in the following manner:

(a) The Working Interest Owner of a Tract or Tracts desiring to commit such Tract or Tracts hereto shall file an application therefor with Unit Operator requesting such admission.

(b) Unit Operator shall circulate a notice to each Working Interest Owner of the proposed expansion, setting out the basis for admission, the proposed participation to be assigned to each such Tract, and other pertinent data. After negotiation (at Working Interest Owners' meeting or otherwise), if 90 per cent of the Working Interest Owners (on the basis of Unit Participation) have agreed to such commitment of such Tract or Tracts, then Unit Operator shall, after preliminary concurrence by the Director:

- (1) Prepare a notice of proposed expansion describing the contemplated changes

in the boundaries of the Unit Area, the reason therefor, the basis for admission of the additional Tract or Tracts, and the Tract Participation to be assigned each such Tract. The effective date thereof shall be 7:00 a.m. of the first day of the month following final approval thereof as herein provided; and

- (2) Deliver copies of said notice to the Supervisor, each Working Interest Owner, lessee, and lessor whose interests are affected (mailing copy of such notice to the last known address of each such Working Interest Owner), advising such parties that thirty (30) days will be allowed for submission to the Unit Operator of any objection to such proposed expansion; and
- (3) File, upon the expiration of said thirty (30) day period, as set out in (2) immediately above, the following: (i) Comprehensive statement as to mailing said notice of expansion; (ii) an application for such expansion in sufficient numbers for appropriate approval and distribution; and (iii) an instrument containing the appropriate joinders in compliance with the participation requirements of Section 14 (Tracts Qualified for Unit Participation) and 33 (Non-Joinder and Subsequent Joinder), infra; and (iv) a copy of any objections received.

The expansion shall, after due consideration of all pertinent information and upon approval by the Director and the Commission, become effective as of the date and hour prescribed above. The revised Tract Participations of the respective Tracts included within the Unit Area prior to such enlargement shall remain in the same ratio one to another.

SECTION 5. UNITIZED LAND AND UNITIZED SUBSTANCES. All oil and gas in and under the land effectively committed to this Agreement within and producible from the Unitized Formation are herein called "Unitized Substances." All land committed to this Agreement as to the Unitized Formation shall constitute land referred to herein as Unitized Land or "land subject to this Agreement."

SECTION 6. UNIT OPERATOR. Continental Oil Company, a Delaware corporation, is hereby designated as Unit Operator, and by signing this instrument as Unit Operator it agrees and consents to accept the duties and obligations of Unit Operator for the operation, development and production of Unitized Substances as herein provided. Whenever reference is made herein to Unit Operator, such reference means the Unit Operator acting in that capacity and not as an owner of interests in Unitized Substances, and the term "Working Interest Owner" when used herein shall include or refer to Unit Operator as the owner of a Working Interest when such an interest is owned by it.

SECTION 7. RESIGNATION OR REMOVAL OF UNIT OPERATOR. Unit Operator shall have the right to resign at any time, but such resignation shall not become effective so as to release Unit Operator from the duties and obligations of Unit Operator and terminate Unit Operator's rights as such for a period of six (6) months after written notice of intention to resign has been given by Unit Operator to all Working Interest Owners and the Supervisor and until all unit wells are placed in a satisfactory condition for suspension, or abandonment of operations, whichever is required by the Supervisor and the Commission, unless a new Unit Operator shall have taken over and assumed the duties and obligations of Unit Operator prior to the expiration of said period.

The Unit Operator may, upon default or failure in the performance of its duties or obligations hereunder, be subject to removal by 75 per cent of the committed Working Interest Owners (on the basis of Unit Participation) exclusive of the Working Interest Owner who is the Unit Operator. Such removal shall be effective upon notice thereof to the Supervisor.

In all such instances of effective resignation or removal, until a successor to Unit Operator is selected and approved as hereinafter provided, the Working Interest Owners shall be jointly responsible for the performance of the duties of the Unit Operator and shall, not later than thirty (30) days before such resignation or removal becomes effective, appoint a Unit Manager to represent them in any action to be taken hereunder.

The resignation or removal of Unit Operator under this Agreement shall not terminate its right, title or interest as the owner of a Working Interest or other interest in Unitized Substances; but, upon the resignation or removal of Unit Operator becoming effective, such Unit Operator shall deliver possession of all equipment, books, and records, materials, appurtenances and any other assets, used in conducting the Unit operations and owned by the Working Interest Owners (including any and all data and information which it might have gained or assembled by reason of its operation of the Unitized Land) to the new duly qualified successor Unit Operator or to the Unit Manager if no such new Unit Operator is elected, to be used for the purpose of conducting Unit operations hereunder. Nothing herein shall be construed as authorizing removal of any material, equipment and appurtenances needed for the preservation of any wells. Nothing herein contained shall be construed to relieve or discharge any Unit Operator who resigns or is removed hereunder for any liability or duties accruing or performable by it prior to the effective date of such resignation or removal.

SECTION 8. SUCCESSOR UNIT OPERATOR. Whenever the Unit Operator shall tender its resignation as Unit Operator or shall be removed as hereinabove provided, the Working Interest Owners

shall select a successor Unit Operator by a majority vote of the Working Interest Owners (on the basis of Unit Participation), provided no Working Interest Owner who has been removed as Unit Operator may vote for self-succession. Such selection shall not become effective until (a) a Unit Operator so selected shall accept in writing the duties and responsibilities of Unit Operator; and (b) the selection shall have been filed with the Supervisor. If no successor Unit Operator is selected and qualified as herein provided, the Director, at his election, may declare this Agreement terminated.

SECTION 9. ACCOUNTING PROVISIONS AND UNIT OPERATING AGREEMENT. Costs and expenses incurred by Unit Operator in conducting Unit operations hereunder shall be paid, apportioned among, and borne by the Working Interest Owners in accordance with the Unit Operating Agreement; however, no such Unit Operating Agreement shall be deemed either to modify any of the terms and conditions of this Unit Agreement or to relieve the Unit Operator of any right or obligation established under this Agreement, and in case of any inconsistency or conflict between this Agreement and the Unit Operating Agreement, this Agreement shall prevail. Required copies of any Unit Operating Agreement executed pursuant to this section shall be filed with the Supervisor prior to approval of this Agreement.

SECTION 10. RIGHTS AND OBLIGATIONS OF UNIT OPERATOR. Except as otherwise specifically provided herein, the exclusive right, privilege and duty of exercising any and all rights of the parties hereto which are necessary or convenient for prospecting for, producing, including producing by secondary recovery methods, storing, allocating and distributing the Unitized Substances are hereby delegated to and shall be exercised by the Unit Operator as herein provided. Upon request, acceptable

evidence of title to said rights shall be deposited with said Unit Operator and together with this agreement shall constitute and define the rights, privileges, and obligations of Unit Operator. Nothing herein, however, shall be construed to transfer title to any land or to any lease or operating agreement, it being understood that under this Agreement the Unit Operator, in its capacity as Unit Operator, shall exercise the rights of possession and use vested in the parties hereto only for the purposes herein specified.

SECTION 11. EASEMENTS OR USE OF SURFACE.

(a) The parties hereto, to the extent of their rights and interests, hereby grant to Working Interest Owners the right to use as much of the surface of the land within the Unit Area as may reasonably be necessary for Unit Operations; provided that nothing herein shall be construed as leasing or otherwise conveying to Working Interest Owners a site for a water, gas injection, processing or other plant, or camp site.

(b) Working Interest Owners shall have free use of brine or water or both from the Unit Area for Unit Operations, except water from any well, lake, pond, or irrigation ditch of a Royalty Owner.

(c) Working Interest Owners shall pay the owner for damages to growing crops, timber, fences, improvements, and structures on the Unit Area that result from Unit Operations.

SECTION 12. PLAN OF OPERATIONS. It is recognized and agreed by the parties hereto that all of the land subject to this Agreement is reasonably proved to be productive of Unitized Substances in paying quantities and that the object and purpose of this Agreement is to formulate and to put into effect a secondary recovery project in order to effect the

greatest economical recovery of Unitized Substances, prevent waste and conserve natural resources. The parties hereto agree that the Unit Operator may, subject to the consent to a plan of operation by the Working Interest Owners and approval by the Supervisor, inject into the Unitized Formation, through any well or wells completed therein, brine, water, air, gas, oil and any one or more other substances whether produced from the Unitized Land or not, and that the location of input wells and the rates of injection therein shall be governed by standards of good geologic and petroleum engineering practices and conservation methods. After commencement of secondary operations, Unit Operator shall furnish the Supervisor monthly injection and production reports for each well in the Unit. The Working Interest Owners and the Supervisor shall be furnished periodic reports on the progress of the plan of operation and any revisions or changes thereto; provided, however, that any major revisions of the plan of operation involving a basic deviation from the initial plan of operation shall be subject to the consent of the Working Interest Owners and approval of the Supervisor.

The initial plan of operation shall be filed with the Supervisor concurrently with the filing of this Unit Agreement for final approval. Said initial plan of operation and all revisions thereof shall be as complete and adequate as the Supervisor may determine to be necessary for timely operation consistent herewith. Thereafter, from time to time before the expiration of any existing plan, the Unit Operator shall submit for like approval a plan for an additional specified period of operation. Reasonable diligence shall be exercised in complying with the obligations of the approved plan of operation.

Notwithstanding anything to the contrary herein contained, the Unit Operator shall commence operations for the secondary recovery of Unitized Substances from the Unit Area within six (6) months after the effective date of this Agreement, or any extension thereof approved by the Supervisor. After such operations are commenced, Unit Operator shall carry on such operations as would a reasonably prudent operator under the same or similar circumstances.

SECTION 13. TRACT PARTICIPATION. In Exhibit "B" attached hereto there are listed and numbered the various Tracts within the Unit Area and set forth opposite each Tract is the Tract Participation of each Tract in the Unit Area calculated on the basis of 100 per cent commitment. The Tract Participation of each Tract was determined by the following formula:

Percentage of Tract Participation =

$$40\% \times \frac{\text{Tract Production during the period from January 1, 1964 through November 1, 1964}}{\text{Unit Area Production during the period from January 1, 1964 through November 1, 1964}}$$

+

$$30\% \times \frac{\text{Tract Remaining Primary Recovery after November 1, 1964}}{\text{Unit Area Remaining Primary Recovery after November 1, 1964}}$$

+

$$30\% \times \frac{\text{Tract Ultimate Primary Recovery}}{\text{Unit Area Ultimate Primary Recovery}}$$

In the event less than all of the Tracts within the Unit Area are qualified for unit participation as of the effective date hereof, Unit Operator shall, as soon as practicable after said effective date, prepare a revised Exhibit "B" setting forth the qualified tracts and showing the revised Tract Participation of each committed Tract, which Tract Participation shall be calculated and determined by using the factors and formulas set forth above, but applying the same only to the qualified Tracts. Unit Operator

shall promptly file copies of such revised Exhibit "B" with the Supervisor, and unless such revised Exhibit "B" is disapproved by the Supervisor within thirty (30) days after such filing, the revised Exhibit "B" shall be effective as of the effective date of this agreement, and shall thereafter govern the allocation of all Unitized Substances subject, however, to any further revision or revisions of Exhibit "B" in accordance with the provisions hereof.

Any Tract within the Unit Area not committed on the effective date hereof may thereafter be committed hereto in the following manner: The owner or owners of the Working Interest in such Tract shall initiate a request directed to Unit Operator for the commitment thereof hereto and such owner or owners, committed Working Interest Owners, and Unit Operator shall thereupon seek to determine the basis therefor, including a Tract Participation for such Tract and any appropriate adjustments of investments. When such matters have been agreed upon by the required vote of Working Interest Owners, as provided for in the Unit Operating Agreement, and upon compliance with the applicable provisions of Sections 14 (Tracts Qualified for Unit Participation) and 33 (Non-Joinder and Subsequent Joinder), then Unit Operator shall file with the Supervisor, the required copies of the instruments of joinder and the revised Exhibit "B," showing the revised Tract Participation; and upon approval by the Director or the Supervisor, such commitment shall be effective at 7 a.m. on the first day of the month following such approval. In any such event, the revised Tract Participations of the respective Tracts entitled to participation prior to such subsequent commitment shall remain in the same ratio one to another.

SECTION 14. TRACTS QUALIFIED FOR UNIT PARTICIPATION.

As the objective of this Unit Agreement is to have lands in the Unit Area operated and entitled to participation under the terms hereof, it is agreed that, notwithstanding anything herein to the contrary, no joinder shall be considered a commitment to this Unit Agreement unless the Tract involved is qualified under this section.

(1) On and after the effective date hereof the Tracts qualified for Unit Participation hereunder shall be the Tracts that qualify as follows:

(a) Each tract as to which Working Interest Owners owning 100% of the Working Interest have become committed to this agreement and as to which (i) Royalty Owners under oil and gas leases on fee land owning seventy-five percent (75%) or more of the Basic Royalty Interest; or (ii) Lessees of Record owning seventy-five percent (75%) or more of the record title interest, whichever is applicable, have become parties to this Agreement.

(b) Each tract as to which Working Interest Owners owning one hundred percent (100%) of the Working Interest have become committed to this Agreement and as to which Royalty Owners under oil and gas leases on fee land owning less than seventy-five percent (75%) of the Basic Royalty Interest or Lessees of Record owning less than seventy-five percent (75%) of the record title interest have become parties to this Agreement and as to which (i) all Working Interest Owners in such Tract have joined in a request for the commitment of such Tract to the Unit Agreement, and as to which

(ii) seventy-five percent (75%) of the combined voting interests of Working Interest Owners in all Tracts that meet the requirements of Section 14(1)(a) have voted in favor of the commitment of such Tract.

For the purpose of this Section 14(1)(b), the voting interest of a Working Interest Owner shall be equal to the ratio that its Unit Participation attributable to Tracts that qualify under Section 14(1)(a) bears to the total Unit Participation of all Working Interest Owners attributable to all Tracts that qualify under Section 14(1)(a).

(c) Each Tract as to which Working Interest Owners owning less than one hundred percent (100%) of the Working Interest have become committed to this Agreement regardless of the percentage of Royalty Owner or Lessee of Record commitment hereto, and as to which (i) the Working Interest Owner who operates the Tract and all of the other Working Interest Owners in such Tract who have become committed to this Agreement have joined in a request for commitment of such Tract to the Unit Agreement, and have executed and delivered an indemnity agreement indemnifying and agreeing to hold harmless the other Working Interest Owners in the Unit Area, their successors and assigns, against all claims and demands that may be made by the owners of Working Interests in such Tract who are not parties to this Agreement, and which arise out of the commitment of the Tract to this Unit Agreement; and as to which (ii) seventy-five percent (75%) of the combined voting interest of Working Interest Owners in all Tracts that meet the requirements of Section

14(1)(a) and 14(1)(b) have voted in favor of the commitment of such Tract and to accept the indemnity agreement.

For the purpose of this Section 14(1)(c), the voting interest of each Working Interest Owner shall be equal to the ratio that its Unit Participation attributable to Tracts that qualify under Section 14(1)(a) and 14(1)(b) bears to the total Unit Participation of all Working Interest Owners attributable to all Tracts that qualify under Section 14(1)(a) and 14(1)(b). Upon the commitment of such a Tract to this Unit Agreement, the Unit Participation that would have been attributed to the nonsubscribing owners of the Working Interest in such Tract, had they become parties to this Agreement and the Unit Operating Agreement, shall be attributed to the Working Interest Owners in such Tract who have become parties to such agreements, in proportion to their respective Working Interests in the Tract.

(2) Subsequent Commitment of Interest to Unit. After the effective date of this Agreement, the commitment of any interest in any Tract within the Unit Area shall be upon such terms as may be negotiated by Working Interest Owners and the owner of such interest.

(3) Revision of Exhibits. If any of the Tracts described in Exhibit "A" fails to qualify for inclusion in the Unit Area, Unit Operator shall recompute, using the original basis of computation, the Tract Participation of each of the qualifying Tracts, and shall revise Exhibits "A" and "B" accordingly. The revised exhibits shall be effective as of the effective date hereof.

SECTION 15. ALLOCATION OF UNITIZED SUBSTANCES. All Unitized Substances produced and saved (less, save and except

any part of such Unitized Substances used in conformity with good operating practices on Unitized Land for drilling, operating, camp, and other production or development purposes and for pressure maintenance or unavoidable loss) shall be apportioned among and allocated to the committed Tracts within the Unit Area in accordance with the respective Tract Participation effective hereunder during the respective periods such Unitized Substances were produced, as set forth in the then effective schedule of participation in Exhibit "B". The amount of Unitized Substances so allocated to each Tract (regardless of whether it be more or less than the amount of the actual production of Unitized Substances from the well or wells, if any, on such Tract), shall, for all intents, uses and purposes, be deemed to have been produced from such Tract.

The Unitized Substances allocated to each Tract shall be distributed among, or accounted for to, the parties executing, consenting to or ratifying this Agreement entitled to share in the production from such Tract in the same manner, in the same proportions, and upon the same conditions, as they would have participated and shared in the production from such Tracts, or in the proceeds thereof, had this Agreement not been entered into, and with the same legal force and effect.

No Tract committed to this Agreement and qualified for participation as above provided shall be subsequently excluded from participation hereunder on account of depletion of Unitized Substances, and nothing herein contained shall be construed as requiring any retroactive adjustment for production obtained prior to the effective date of the joinder of any tract.

If the Working Interest and the Royalty Interest in any Tract are or become divided with respect to separate parcels or portions of such Tract and owned severally by

different persons, the Tract Participation assigned to such Tract shall, in the absence of a recordable instrument executed by all owners and furnished to Unit Operator fixing the divisions of ownership, be divided among such parcels or portions in proportion to the number of surface acres in each.

The Unitized Substances allocated to each Tract shall be delivered in kind to the respective Working Interest Owners and parties entitled thereto by virtue of the ownership of oil and gas rights therein. Each Working Interest Owner and the parties entitled thereto shall have the continuing right to receive such production in kind at a common point within the Unit Area and to sell or dispose of the same as it sees fit. Each such party shall have the right to construct, maintain and operate all necessary facilities for that purpose on Unitized Land, provided the same are so constructed, maintained and operated as not to interfere with operations carried on pursuant hereto. Subject to Section 16 (Royalty Settlement) hereof, any extra expenditure incurred by Unit Operator by reason of the delivery in kind of any portion of the Unitized Substances shall be borne by the party receiving the same in kind.

In the event any party hereto shall fail to take or otherwise adequately dispose of its proportionate share of the Unitized Substances currently as and when produced, then so long as such conditions continue, Unit Operator, for the account and at the expense of such party and in order to avoid curtailing the operation of the Unit Area, may sell or otherwise dispose of such production to itself or others on a day-to-day basis at not less than the prevailing market price in the area for like production; and the account of such party

shall be charged therewith as having received such production. The net proceeds, if any, of the Unitized Substances so disposed of by Unit Operator shall be paid to the party entitled thereto; provided, however, Unit Operator shall not make a sale into interstate commerce of any Working Interest Owner's share of gas production without first giving such Working Interest Owner sixty (60) days' notice of such intended sale.

The Working Interest Owners of each Tract shall be responsible for the payment of all Royalty on or affecting such Tract; and each such party shall hold each other party hereto harmless against all claims, demands and causes of action for such Royalty.

If, after the effective date of this Agreement, there is any Tract or Tracts that are subsequently committed hereto, as provided in Section 4 (Expansion) and Section 13 (Tract Participation) hereof, or if any Tract is excluded from the Unit Area as provided for in Section 32 (Loss of Title), the schedule of participation as shown in the current Exhibit "B" shall be revised by the Unit Operator and distributed to the Working Interest Owners, the Supervisor, and the Director to show the new percentage participation of all the committed Tracts; and the revised schedule, upon approval by the Supervisor under Section 32 (Loss of Title) or the Director under Section 4 (Expansion), shall govern all the allocation of Unitized Substances from and after the effective date thereof until the effective date of a new schedule so approved. The Tract Participations of all Tracts participating prior to any such revision shall remain in the same ratio one to the other.

SECTION 16. ROYALTY SETTLEMENT. The United States of America and all Royalty Owners who, under an existing contract,

are entitled to take in kind a share of the Unitized Substances produced from any Tract unitized hereunder, shall continue to be entitled to such right to take in kind their share of the Unitized Substances allocated to such Tract, and Unit Operator shall make deliveries of such Royalty share taken in kind in conformity with the applicable contracts, laws and regulations. Settlement for Royalty Interest not taken in kind shall be made by Working Interest Owners responsible therefor under existing contracts, laws and regulations, on or before the last day of each month for Unitized Substances produced during the preceding calendar month; provided, however, that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any Royalty due under their leases, except that such Royalty shall be computed in accordance with the terms of this Unit Agreement.

If gas obtained from lands not subject to this Agreement is introduced into the Unitized Formation for use in repressuring, stimulation or production or increasing ultimate recovery in conformity with a plan approved pursuant to Section 12 (Plan of Operations), a like amount of gas, less appropriate deductions for loss from any cause, may be withdrawn from the Unitized Formation, Royalty free as to dry gas but not as to the products extracted therefrom; provided such withdrawal shall be pursuant to such conditions and formulas as may be prescribed or approved by the Supervisor, and provided further that such right of withdrawal shall terminate as of the effective date of termination of the Unit Agreement.

All Royalty due the United States of America and the other Royalty Owners hereunder shall be computed and paid on the basis of all Unitized Substances allocated to the respective Tract

or Tracts committed hereto, in lieu of actual production from such Tract or Tracts.

Royalty due the United States shall be computed as provided in the operating regulations and paid in value or delivered in kind as to all Unitized Substances on the basis of the amounts thereof allocated to unitized Federal land as provided herein at the rates specified in the respective Federal leases, or at such lower rate or rates as may be authorized by law or regulation; provided that, for leases on which the Royalty Rate depends on the daily average production per well, said average production shall be determined in accordance with the operating regulations as though the Unitized Land were a single consolidated lease.

Each Royalty Owner (other than the United States of America) that executes this Agreement represents that it is the owner of a Royalty Interest in a Tract or Tracts within the Unit Area as its interest appears in Exhibit "B" attached hereto. If any Royalty Interest in a Tract or Tracts should be lost by title failure or otherwise in whole or in part during the term of this Agreement, then the Royalty Interest of the party representing himself to be the owner thereof shall be reduced proportionately and the interest of all parties in the affected Tract or Tracts shall be adjusted accordingly.

SECTION 17. RENTAL SETTLEMENT. Rentals or minimum royalties due on leases committed hereto shall be paid by Working Interest Owners responsible therefor under existing contracts, laws and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any rental or minimum royalty in lieu thereof, due under their leases. Rental or minimum royalty for lands of the United

States of America subject to this Agreement shall be paid at the rate specified in the respective leases from the United States of America, unless rental or minimum royalty is waived, suspended, or reduced by law or by approval of the Secretary or his duly authorized representative.

SECTION 18. CONSERVATION. Operations hereunder and production of Unitized Substances shall be conducted to provide for the most economical and efficient recovery of said substances without waste, as defined by or pursuant to Federal and State laws and regulations.

SECTION 19. DRAINAGE. The Unit Operator shall take appropriate and adequate measures to prevent drainage of Unitized Substances from Unitized Land by wells on land not subject to this Agreement.

SECTION 20. LEASES AND CONTRACTS CONFORMED AND EXTENDED. The terms, conditions and provisions of all leases, subleases and other contracts relating to exploration, drilling, development or operation for oil or gas on lands committed to this Agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect; and the parties hereto hereby consent that the Secretary shall, and by his approval hereof, or by the approval hereof by his duly authorized representatives, does hereby establish, alter, change or revoke the drilling, producing, rental, minimum royalty and royalty requirements of Federal leases committed hereto and the regulations in respect thereto to conform said requirements to the provisions of this Agreement.

Without limiting the generality of the foregoing, all leases, subleases and contracts are particularly modified

in accordance with the following:

(a) The development and operation of lands subject to this Agreement under the terms hereof shall be deemed full performance of all obligations for development and operation with respect to each and every part or separately owned tract subject to this Agreement, regardless of whether there is any development of any particular part or Tract of the Unit Area, notwithstanding anything to the contrary in any lease, operating agreement or other contract by and between the parties hereto, or their respective predecessors in interest, or any of them.

(b) Drilling, producing or secondary recovery operations performed hereunder upon any Tract of Unitized Lands shall be accepted and deemed to be performed upon and for the benefit of each and every Tract of Unitized Land, and no lease shall be deemed to expire by reason of failure to drill or produce wells situated on land therein embraced.

(c) Suspension of drilling or producing operations on all Unitized Land pursuant to direction or consent of the Supervisor or his duly authorized representatives shall be deemed to constitute such suspension pursuant to such direction or consent as to each and every Tract of Unitized Land.

(d) Each lease, sublease, or contract relating to the exploration, drilling, development or operation for oil and gas which by its terms might expire prior to the termination of this Agreement is hereby extended beyond any such term so provided therein, so that it shall be continued in full force and effect for and during the term of this Agreement.

(e) Termination of this Agreement shall not affect any lease which, pursuant to the terms thereof or any applicable laws, shall continue in force and effect thereafter.

(f) The segregation of any Federal lease committed to this Agreement is governed by the following provision in the fourth paragraph of Sec. 17 (j) of the Mineral Leasing Act, as amended by the Act of September 2, 1960 (74 Stat. 781-784):

"Any (Federal) lease heretofore or hereafter committed to any such (unit) plan embracing lands that are in part within and in part outside of the area covered by any such plan shall be segregated into separate leases as to the lands committed and the lands not committed as of the effective date of unitization: Provided, however, that any such lease as to the non-unitized portion shall continue in force and effect for the term thereof but for not less than two years from the date of such segregation and so long thereafter as oil or gas is produced in paying quantities."

SECTION 21. MATHEMATICAL ERRORS. It is hereby agreed by all parties to this Agreement that Unit Operator is empowered

to correct any mathematical or clerical errors which might exist in this Agreement and file such changes with the Supervisor.

SECTION 22. COVENANTS RUN WITH LAND. The covenants herein shall be construed to be covenants running with the land with respect to the interest of the parties hereto and their successors in interest until this Agreement terminates, and any grant, transfer or conveyance of interest in land or leases subject hereto shall be, and hereby is, conditioned upon the assumption of all privileges and obligations hereunder by the grantee, transferee or other successor in interest. No assignment or transfer of any Working Interest subject hereto shall be binding upon Unit Operator until the first day of the calendar month after Unit Operator is furnished with the original, or acceptable photostatic or certified copy, of the recorded instrument of transfer; and no assignment or transfer of any Royalty Interest subject hereto shall be binding upon the Working Interest Owner responsible therefor until the first day of the calendar month after said Working Interest Owner is furnished with the original, or acceptable photostatic or certified copy, of the recorded instrument of transfer.

SECTION 23. WAIVER OF RIGHT TO PARTITION. Each party hereto covenants that, during the existence of this agreement, it will not resort to any action to partition the Unit Area as to the Unitized Formation or the Unit Equipment, and to that extent waives the benefits of all laws authorizing such partition.

SECTION 24. EFFECTIVE DATE AND TERM. This Agreement shall become binding upon each party who executed or ratified it as of the date of execution or ratification by such party and shall become effective as of 7 a.m. on the first day of the

month next following:

(a) The execution or ratification of this Agreement and the Unit Operating Agreement by Working Interest Owners sufficiently to commit under Section 14 (Tracts Qualified for Unit Participation) hereof 85% (measured by surface area) of the lands comprising the Unit Area; and

(b) The approval of this Agreement by the Director and the Commission; and

(c) The filing of at least one counterpart of this Agreement for record in the office of the county clerk of Lea County, New Mexico, by the Unit Operator; and provided, further, that if (a), (b) and (c) above are not accomplished on or before January 1, 1967, this Agreement shall ipso facto expire on said date (hereinafter called "expiration date") and thereafter be of no further force or effect, unless prior thereto Working Interest Owners owning a combined Unit Participation of at least 75% have become parties to this Agreement and have decided to extend the expiration date for a period not to exceed six (6) months. If the expiration date is so extended and requirements of Section 24 (a) are not accomplished on or before the extended expiration date, this Agreement shall ipso facto expire on the extended expiration date and thereafter be of no further effect. For the purpose of this section, Unit Participation shall be as shown on the original Exhibit "B" attached to the Unit Agreement.

(d) Unit Operator shall, within thirty (30) days after the effective date of this Agreement, file for record in the county office where a counterpart of this Agreement is recorded, a certificate to the effect that this Agreement has become effective according to its terms and stating further the effective date.

The term of this Agreement shall be for and during the time that Unitized Substances are or can be produced in paying quantities from the Unitized Land and as long thereafter as drilling, reworking or other operations (including secondary recovery operations) are prosecuted thereon without cessation of more than ninety (90) consecutive days, and so long thereafter as Unitized Substances are or can be produced in paying quantities from the Unitized Land. Termination under this paragraph shall be effective as of the first day of the month after the Unit Operator determines, on confirmatory data satisfactory to the Director, that Unitized Substances are no longer being produced in paying quantities from the Unitized Land.

This Agreement may be terminated by Working Interest Owners owning ninety (90%) percent Unit Participation at any time for any other reason with the approval of the Director and the Commission. Notice of any such termination shall be given by Unit Operator to all parties hereto.

Upon termination of this Agreement, Unit Operations shall cease, and thereafter the parties hereto shall be governed by the terms and provisions of the leases and contracts affecting the separate tracts.

If not otherwise covered by the leases unitized under this Agreement, Royalty Owners hereby grant Working Interest Owners a period of six (6) months after termination of this Agreement in which to salvage, sell, distribute or otherwise dispose of the personal property and facilities used in connection with Unit Operations.

SECTION 25. RATE OF PROSPECTING, DEVELOPMENT AND PRODUCTION. All production and the disposal thereof shall be in conformity with allocations and quotas made or fixed by any duly authorized person or regulatory body under any Federal or State statute. The Director is hereby vested with authority to alter or modify from time to time, in his discretion, the rate of prospecting and development and within the limits made or fixed by the Commission to alter or modify the quantity and rate of production under this Agreement, such authority being hereby limited to alteration or modification in the public interest, the purpose thereof and the public interest to be served thereby to be stated in the order of alteration or modification; provided, further, that no such alteration or modification shall be effective as to any privately owned lands subject to this Agreement as to the quantity and rate of

production in the absence of specific written approval thereof by the Commission.

Powers in this Section vested in the Director shall only be exercised after notice to Unit Operator and opportunity for hearing to be held not less than fifteen (15) days from notice.

SECTION 26. NON-DISCRIMINATION. In connection with the performance of work under this Agreement, the operator agrees to comply with all of the provisions of Section 202, (1) to (7) inclusive, of Executive Order 11246 (30 F.R. 12319), which are hereby incorporated by reference in this Agreement.

SECTION 27. APPEARANCES. Unit Operator shall have the right to appear for or on behalf of any and all interests affected hereby before the Department, and the Commission, and to appeal from any order issued under the rules and regulations of the Department or the Commission, or to apply for relief from any of said rules and regulations or in any proceedings relative to operations before the Department or the Commission, or any other legally constituted authority; provided, however, that any other interested party shall also have the right at his or its own expense to be heard in any such proceeding.

SECTION 28. NOTICES. All notices, demands, objections or statements required hereunder to be given or rendered to the parties hereto shall be deemed fully given if made in writing and personally delivered to the party or parties or sent by postpaid mail, addressed to such party or parties at their respective addresses set forth in connection with the signatures hereto or to the ratification or consent hereof or to such other address as any such party or parties may have furnished in writing to the party sending the notice, demand or statement.

SECTION 29. NO WAIVER OF CERTAIN RIGHTS. Nothing in this Agreement contained shall be construed as a waiver by any party hereto of the right to assert any legal or constitutional right or defense as to the validity or invalidity of any law of the State wherein said Unitized Lands are located, or rules or regulations issued thereunder in any way affecting such party, or as a waiver by any such party of any right beyond his or its authority to waive.

SECTION 30. EQUIPMENT AND FACILITIES - FIXTURES ATTACHED TO REALTY. Each Working Interest Owner has heretofore placed and used on its Tract or Tracts committed to this Agreement various well and lease equipment and other property, equipment and facilities. It is also recognized that additional equipment and facilities may hereafter be placed and used upon the Unit Area as now or hereafter constituted. Therefore, for all purposes of this Agreement, any and all such equipment shall be considered to be personal property and not fixtures attached to realty. Accordingly, said well and lease equipment and personal property is hereby severed from the mineral estates affected by this Agreement; and it is agreed that any and all such equipment and personal property shall be and remain personal property for all purposes.

SECTION 31. UNAVOIDABLE DELAY. All obligations under this Agreement requiring the Unit Operator to commence or continue secondary recovery operations or to operate on or produce Unitized Substances from any of the lands covered by this Agreement shall be suspended while, but only so long as, the Unit Operator, despite the exercise of due care and diligence, is prevented from complying with such obligations, in whole or in part, by strikes, acts of God, Federal, State or municipal

law or agency, unavoidable accident, uncontrollable delays in transportation, inability to obtain necessary materials in open market, or other matters beyond the reasonable control of the Unit Operator whether similar to matters herein enumerated or not.

SECTION 32. LOSS OF TITLE. In the event title to the Working Interest in any Tract of Unitized Land shall fail so as to render the Tract inoperable under this Agreement and the true owner cannot be induced to join this Unit Agreement, such Tract shall be automatically regarded as not committed hereto effective as of 7 a.m. on the first day after such title failure is determined and there shall be such readjustment of future costs and benefits as may be required on account of the loss of such title. In the event of a dispute as to title as to any Royalty, Working Interest or other interest subject thereto, payment or delivery on account thereof may be withheld without liability or interest until the dispute is finally settled; provided that, as to Federal land or leases, no payments of funds due the United States of America shall be withheld, but such funds shall be deposited as directed by the Supervisor, to be held as unearned money pending final settlement of the title dispute, and then applied as earned or returned in accordance with such final settlement.

Unit Operator as such is relieved from any responsibility for any defect or failure or any title hereunder.

SECTION 33. NON-JOINDER AND SUBSEQUENT JOINDER. Joinder by any Royalty Owner or Lessee of Record, at any time, must be accompanied by appropriate joinder of the corresponding Working Interest Owner in order for the interest of such Royalty Owner or Lessee of Record to be regarded as effectively committed.

Joinder to the Unit Agreement by a Working Interest Owner, at any time, must be accompanied by appropriate joinder to the Unit Operating Agreement in order for such interest to be regarded as committed to this Unit Agreement.

Any oil or gas interest in the Unitized Formation underlying the Unit Area not committed hereto prior to submission of this Agreement to the Director for final approval may thereafter be committed hereto upon compliance with the applicable provisions of this Section and of Section 14 (Tracts Qualified for Unit Participation) hereof, at any time up to the effective date hereof on the same basis of participation as provided in said Section 14, by the owner or owners thereof subscribing, ratifying, or consenting in writing to this Agreement and, if the interest is a Working Interest, by the owner of such interest subscribing also to the Unit Operating Agreement.

It is understood and agreed, however, that from and after the effective date hereof the right of subsequent joinder by a Working Interest Owner, as provided in this Section, shall be governed by the provisions of Section 4 (Expansion) and of Section 13 (Tract Participation). Except as may be otherwise herein provided, subsequent joinder by a Royalty Owner pursuant to this Section shall be effective as of 7 a.m. of the first day of the month following the filing with the Supervisor for approval of duly executed counterparts of any and all documents necessary to establish effective commitment of his interest to this Agreement.

SECTION 34. OIL IN LEASE TANKAGE ON EFFECTIVE DATE. Unit Operator shall make a proper and timely gauge of all tanks on Unitized Land in order to ascertain the amount of merchantable oil above the pipe line connection in such tanks as of 7 a.m. on

the effective date hereof. All such oil which has then been produced legally shall be and remain the property of the Working Interest Owner entitled thereto the same as if the Unit had not been formed; and such Working Interest Owner shall promptly remove said oil from the Unitized Land. Any such oil not so removed shall be sold by Unit Operator for the account of such Working Interest Owner, subject to the payment of all Royalty to Royalty Owners under the terms and provisions of the Unit Agreement and any applicable lease or leases and other contracts. The oil that is in excess of the prior allowable of the wells from which it was produced shall be regarded as Unitized Substances allocated to such Tract.

SECTION 35. COUNTERPARTS. This Agreement may be executed in any number of counterparts, no one of which needs to be executed by all parties and may be ratified or consented to by separate instrument in writing specifically referring hereto, and shall be binding upon all those parties who have executed such a counterpart, ratification or consent hereto with the same force and effect as if all parties had signed the same document, and regardless of whether or not it is executed by all other parties owning or claiming an interest in the lands within the above-described Unit Area.

SECTION 36. TAXES. Each party hereto shall, for its own account, render and pay its share of any taxes levied against or measured by the amount or value of the Unitized Substances produced from the Unitized Land; provided, however, that if it is required or if it be determined that the Unit Operator or the several Working Interest Owners must pay or advance said taxes for the account of the parties hereto, it is hereby expressly agreed that the parties so paying or advancing said taxes

shall be reimbursed therefor by the parties hereto, including Royalty Owners, who may be responsible for the taxes on their respective allocated share of said Unitized Substances. No such taxes shall be charged to the United States or to any lessor who has a contract with a lessee which requires his lessee to pay such taxes.

SECTION 37. CONFLICT OF SUPERVISION. Neither the Unit Operator nor the Working Interest Owners, nor any of them, shall be subject to any forfeiture, termination or expiration of any rights hereunder or under any leases or contracts subject hereto, or to any penalty or liability on account of delay or failure in whole or in part to comply with any applicable provisions thereof to the extent that the said Unit Operator or the Working Interest Owners, or any of them, are hindered, delayed or prevented from complying therewith by reason of failure of the Unit Operator to obtain, in the exercise of due diligence, the concurrence of proper representatives of the United States and proper representatives of the State of New Mexico in and about any matters or things concerning which it is required herein that such concurrence be obtained. The parties hereto, including the Commission, agree that all powers and authority vested in the Commission in and by any provisions of this Agreement are vested in the Commission and shall be exercised by it pursuant to the provisions of the laws of the State of New Mexico and subject in any case to appeal or judicial review as may now or hereafter be provided by the laws of the State of New Mexico.

SECTION 38. NO PARTNERSHIP. It is expressly agreed that the relation of the parties hereto is that of independent contractors and nothing in this Agreement contained, express or implied, or any operations conducted hereunder, shall create

or be deemed to have created a partnership or association between the parties hereto or any of them.

SECTION 39. BORDER AGREEMENTS. Subject to the approval of the Supervisor, the Unit Operator, with concurrence of 75% of the voting interest of the Working Interest Owners, may enter into a border-protection agreement or agreements with the Working Interest Owners of adjacent lands along the exterior boundary of the Unitized Land with respect to the operations in the border area for the maximum ultimate recovery, conservation purposes and proper protection of the parties and interests.

SECTION 40. LIMITATION OF APPROVALS. Notwithstanding anything herein contained to the contrary, if no Federal lands are committed to this Agreement, then no consents or approvals provided herein shall be required of the Department, the Secretary, the Director, or the Supervisor, and it shall not be necessary to file any instrument hereunder with said officers or agencies unless and until Federal Lands are so committed to this Agreement; likewise, if no fee lands are committed to this Agreement, then no consents or approvals provided herein shall be required of the Commission, and it shall not be necessary to file any instrument hereunder with said office unless and until fee lands are so committed to this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and have set opposite their respective names the date of execution.

Attest:

Secretary
Date: _____

CONTINENTAL OIL COMPANY

By _____
Its _____

UNIT OPERATOR AND WORKING
INTEREST OWNER

ATTEST:

PAN AMERICAN PETROLEUM CORPORATION

By _____

Its _____

Date: _____

THE ATLANTIC REFINING COMPANY

ATTEST:

By _____

Its _____

Date: _____

STATE OF _____ I

COUNTY OF _____ I

The foregoing instrument was acknowledged before me this
____ day of _____, 19____, by _____,
_____ of CONTINENTAL OIL COMPANY, a Delaware
corporation, on behalf of said corporation.

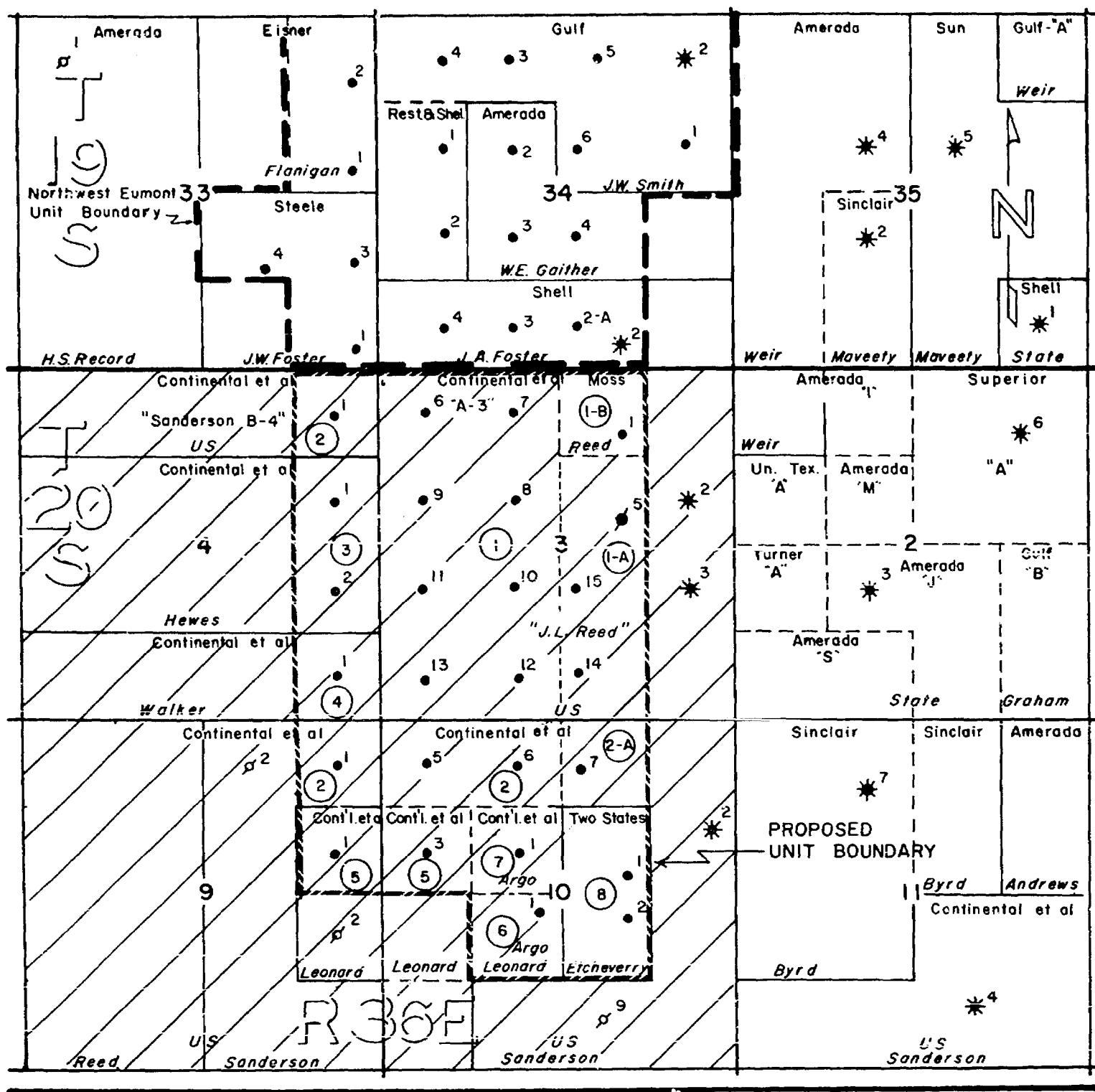
My Commission expires: _____ Notary Public, _____ County, _____

STATE OF _____ I

COUNTY OF _____ I

The foregoing instrument was acknowledged before me this
____ day of _____, 19____, by _____,
_____ of _____,
a _____ corporation, on behalf of said corporation.

My Commission expires: _____ Notary Public, _____ County, _____



CONTINENTAL OIL COMPANY

PRODUCTION DEPARTMENT
HOBBS DISTRICT

REED-SANDERSON UNIT

Lea County, New Mexico

UNIT AREA

TRACT NUMBERS

SCALE
0' 1000' 2000'

EXHIBIT A

**EXHIBIT "B" TO UNIT AGREEMENT
REED-SANDERSON UNIT, LEA COUNTY, N. M.**

Tract No.	Description of Land	No. of Acres	Serial No. & Exp. Date	Basic Royalty	Record Lessee	Overriding Royalty Owner and Percentage	Working Interest and Percentage	Tract Participation (Percent)	
1	Section 3 Lots 3 & 4 S/2 NW/4, SW/4 (T20S-R36E)	320.40	LC 030143(a) HBP	USA 12.5% J. L. Reed	(See Appendix Note #1)	Atl. Richfield Chevron Oil Co. Continental Oil Pan Am. Petro.	25.0 25.0 25.0 25.0	59.91898	
1-A	Section 3 SW/4 NE/4 W/2 SE/4	120.00	LC 030143(a) HBP	USA Schedule C	J. L. Reed ditto	Atl. Richfield Chevron Oil Co. Continental Oil Pan Am. Petro.	25.0 25.0 25.0 25.0	8.91574	
1-B	Section 3 Lot 2	40.27	LC 030143(a) HBP	USA Schedule C	J. L. Reed (See Appendix Note #2)	H. S. Moss	100.0	8.80272	
2	Section 4, Lot 1 Section 9, NW/4 NE/4 Section 10, N/2 NW/4	160.16	LC 031622(b) HBP	USA 12.5% Helen Thompson Sanderason	None	Atl. Richfield Chevron Oil Co. Continental Oil Pan Am. Petro.	25.0 25.0 25.0 25.0	8.12698	
2-A	Section 10, NW/4 NE/4	40.00	LC 031622(b) HBP	USA Schedule D	Helen Thompson Sanderason	None	Atl. Richfield Chevron Oil Co. Continental Oil Pan Am. Petro.	25.0 25.0 25.0 25.0	2.65722
3	Section 4, SE/4 NE/4, NE/4 SE/4	80.00	HBP	(See Appendix Note 3)	Atl. Richfield Chevron Oil Co. Continental Oil Pan Am. Petro.	(See Appendix Note #4)	Apco Oil Co. 14.062500 Atl. Richfield 21.494375 Chevron Oil 21.484375 Continental 21.484375 Pan Am. Petro 21.484375	2.19268	
Five Federal tracts containing 680.83 acres or 65.41% of the Unit Area									

Five Federal tracts containing 680.83 acres or 65.41% of the Unit Area

Reed-Sanderson Unit
Exhibit "B"
Page 2

Tract No.	Description of Land	No. of Acres	Serial No. & Exp. Date	Basic Royalty	Record Lessee	Overriding Royalty Owner & Percentage	Working Interest and Percentage	Tract Partial-Partion (Percent)
4	Section 4, SE/4 SE/4	40.00	HBP	(See Appendix Note 5)	Atlantic Richfield Chevron Oil Co. Continental Oil Pan Am. Petroleum	None	Atl. Richfield 25.0 Chevron Oil 25.0 Continental Oil 25.0 Pan Am. Petro 25.0	1.88640
5	Section 9, SE/4 NE/4 Section 10, SW/4 NW/4	80.00	HBP	(See Appendix Note #6)	Atlantic Richfield Chevron Oil Company Continental Oil Co. Pan Am. Petroleum	Apco 1.17187 J.H. Moore 0.39063	(See Appendix Note #7)	0.48881
6	Section 10, NE/4 SW/4	40.00	HBP	(See Appendix Note #8)	Atlantic Richfield Chevron Oil Co. Continental Oil Pan Am. Petroleum	Apco 0.58594 J.H. Moore 0.19531	(See Appendix Note #9)	0.31137
7	Section 10, SE/4 NW/4	40.00	HBP	Bradley Prod. 3.12500% Atl. Richfld 0.62500% Chase Manhattan Bank 11.87500% Ashland Oil & Refg. 3.12500%	Atlantic Richfield Chevron Oil Co. Continental Oil Pan Am. Petroleum	None	Amerada 25.0 Atl. Richfield 18.75 Chevron Oil 18.75 Continental Oil 18.75 Pan Am. Petrol. 18.75	2.83730
8	Section 10, SW/4 NE/4 NW/4 SE/4	80.00	HBP	Josefa Etcheverry 4.16667% Mary Black 8.333333%	F. E. Vosburg	Gulf Oil Corp. 6.25000	Two States Oil Key States Oil Herman Crile	50.0 3.86180 37.50 12.50

APPENDIX TO EXHIBIT "B"

NOTE 1 - OVERRIDING ROYALTY OWNERSHIP UNDER TRACTS NO. 1 AND 1-A

Column A provides for an overriding royalty of 7-1/2% during the period or periods when the average production per well per day is more than 15 barrels on the entire leasehold or any part of the area thereof or any zone segregated for computation of royalties.

Column B provides for an overriding royalty of 5% during the period when the average production per well per day is 15 barrels or less on the entire leasehold or any part of the area or any zone segregated for computation of royalties.

<u>O. R. R. Owner</u>	<u>Col. A (%)</u>	<u>Col. B (%)</u>
Roy G. Barton	0.06250	0.04167
Continental Corporation	0.27300	0.18200
Hugh Corrigan	0.12500	0.08333
Rose Eaves	1.00000	0.66667
Elizabeth Hannifin	0.37500	0.25000
Donald L. Jones	0.25390	0.16927
Marjorie Cone Kastman, Guardian of the Estate of S. E. Cone	0.39062	0.26042
Harry Leonard	0.09375	0.06250
Mabel F. Leonard	0.09375	0.06250
Mabee Royalties, Inc.	0.28125	0.18750
J. M. Mouser	0.04167	0.02778
Mary Ruth McCrory	1.00000	0.66667
W. T. Reed	1.00000	0.66666
O. L. Nislar	0.09766	0.06510
Hallie Carlton Posey	0.34766	0.23177
Robin Oil Company	0.72700	0.48466
Sabine Royalty Corporation	0.43750	0.29167
Sunshine Royalty Corporation	0.18750	0.12500
Hattie Cone Williams	0.37500	0.25000
J. H. Williams	0.16016	0.10677
W. A. Yeager & J. M. Armstrong	0.17708	0.11806
Total	7.50000	5.00000

NOTE 2 - OVERRIDING ROYALTY OWNERSHIP UNDER TRACT NO. 1-B

Column A provides for an overriding royalty of 7-1/2% during the period or periods when the average production per well per day is more than 15 barrels on the entire leasehold or any part of the area thereof or any zone segregated for computation of royalties.

Column B provides for an overriding royalty of 5% during the period when the average production per well per day is 15 barrels or less on the entire leasehold or any part of the area or any zone segregated for computation of royalties.

<u>O. R. R. Owner</u>	<u>Col. A (%)</u>	<u>Col. B (%)</u>
Roy G. Barton	0.06250	0.04167
Continental Corporation	0.27300	0.18200
Hugh Corrigan	0.12500	0.08333
Rose Eaves	1.00000	0.66667
Elizabeth Hannifin	0.37500	0.25000
Donald L. Jones	0.25390	0.16927
Marjorie Cone Kastman, Guardian of the Estate of S. E. Cone	0.39062	0.26042

NOTE 2 (Continued)

<u>C.R.R. Owner</u>	<u>Col. A (%)</u>	<u>Col. B (%)</u>
Harry Leonard	0.09375	0.06250
Mabel F. Leonard	0.09375	0.06250
Mabee Royalties, Inc.	0.28125	0.18750
J. M. Mouser	0.04167	0.02778
Mary Ruth McGroary	1.00000	0.66667
W. T. Reed	1.00000	0.66666
O. L. Nislar	0.09766	0.06510
Hallie Carlton Posey	0.34766	0.23177
Robin Oil Company	0.72700	0.48466
Sabine Royalty Corporation	0.43750	0.29167
Sunshine Royalty Corporation	0.18750	0.12500
Hattie Cone Williams	0.37500	0.25000
J. H. Williams	0.16016	0.10677
W. A. Yeager and J. M. Armstrong	0.17708	0.11806
Atlantic Richfield Company	1.25000	1.25000
Chevron Oil Company	1.25000	1.25000
Continental Oil Company	1.25000	1.25000
Pan American Petroleum Corp.	1.25000	1.25000

NOTE NO. 3 - BASIC ROYALTY UNDER TRACT NO. 3

Alfred E. Cooper	0.03906
G. H. Vaughn, Jr. and J. C. Vaughn, Trustees U/W of G. H. Vaughn	0.97656
June D. Speight	1.36719
Lea Salter Cooper Allan	0.03906
G. H. Vaughn, Jr.	0.48828
Jack C. Vaughn	0.48828
Margaret K. Hunker	0.19531
Estate of Frank Hewes	0.19531
Jim Hewes	1.75781
Charles B. Read	0.39063
Lee Carter	1.56250
John H. Ware	0.19531
Guy H. Hooper	0.39063
Mildred A. Wright	0.46875
Laura Kaempf	0.11719
Hazel Bruggman, Noble C. Enfield and Jessie LaCosta	0.01953
Bertha M. Rightmire and Elizabeth E. Wright	0.03906
Kenneth H. Wise and Georgia Wise	0.01953
Cecil F. Rooks and Ruby B. Rooks	0.03906
Howard V. Kratz and Bernice L. Kratz	0.01953
Edward H. Swasand	0.03906
Joseph W. McBride and Agnes J. McBride	0.07813
Lawrence C. Brua	0.01953
Andrew Berkedal	0.01953
Myrtle V. Madson	0.05860
Albert Esten	0.19531
Edward F. Hindman	0.15625
Ethel Hard Wring	0.13199
Frances Hard Kincer	0.13199
George Hard	0.13199
Jimmie Sue Hoge	0.13199
Margaret Hard Clement	0.13199
Ruby Hard	2.18277
Marion Hard	0.15030
Mary Belle Hard	0.13199

12.50000%

Reed-Sanderson Unit
Appendix to Exhibit "B"
Page 3

NOTE NO. 4 - OVERRIDING ROYALTY UNDER TRACT NO. 3

Guy H. Hooper and Mabel S. Hooper	0.195313
Ethel Hard Wring	0.065994
Frances Hard Kincer	0.065994
George Hard	0.065994
Jimmie Sue Hoge	0.065994
Margaret Hard Clement	0.065994
Ruby Hard	1.091385
Marian Hard	0.075150
G. H. Vaughn, Jr. and J. C. Vaughn, Tr. U/W G. H. Vaughn	0.488281
Mary Belle Hard	0.065994
G. H. Vaughn, Jr.	0.244141
Jack C. Vaughn	0.244141
	<u>2.734375%</u>

NOTE NO. 5 - BASIC ROYALTY UNDER TRACT NO. 4

Main Street Holding	6.250000
J. Hiram Moore	1.562500
Charles B. Read	0.390625
H. Dillard Schenck	0.390625
J. F. Simmons	0.781250
June D. Speight	3.125000
	<u>12.500000%</u>

NOTE NO. 6 - ROYALTY INTEREST UNDER TRACT NO. 5

Tenneco Oil Company	6.25000
Sunshine Royalty Company	6.25000
T. J. Jefferies	2.34376
Elizabeth Woolworth	1.30208
May Woolworth	1.62760
W. M. Beauchamp	3.12500
Martha Watkins Harris	0.32552
Myrtle Dean Watkins	0.32552
Mrs. Clyde W. Miller	0.32552
	<u>21.87500%</u>

NOTE NO. 7 - WORKING INTEREST OWNERSHIP UNDER TRACT NO. 5

Apco Oil Company	34.37500
Atlantic Richfield Company	15.62500
Chevron Oil Company	15.62500
Continental Oil Company	15.62500
J. H. Moore	3.12500
Pan American Petroleum Corporation	15.62500
	<u>100.00000%</u>

NOTE NO. 8 - BASIC ROYALTY UNDER TRACT NO. 6

Ashland Oil & Refining Company	1.56250
Bradley Production Corporation	1.56250
T. J. Jefferies	1.17188
Tenneco Oil Company	3.12500

NOTE NO. 8 (Continued)

H. L. Lowe	1.56250
Sunshine Royalty Company	3.12500
Atlantic Richfield Company	0.31250
The Chase Manhattan Bank	5.93750
Est. of Mr. J. E. Watkins	0.48828
Elizabeth Woolworth	0.65104
May Woolworth	0.81380
	<u>20.31250%</u>

NOTE NO. 9 - WORKING INTEREST UNDER TRACT NO. 6

Amerada Oil Corporation	12.50000
Apco Oil Corporation	4.68750
Atlantic Richfield Company	17.18750
Chevron Oil Company	17.18750
Continental Oil Company	17.18750
H. L. Lowe	12.50000
J. H. Moore	1.56250
Pan American Petroleum Corporation	17.18750
	<u>100.00000%</u>

SCHEDULE OF PARTICIPATION PARAMETERS
PROPOSED REED-SANDERSON UNIT

<u>Operator</u>	<u>Lease</u>	<u>Tract No.</u>	<u>Tract Current Prod. 1-1-64 to 11-1-64</u>	<u>40 x Tract Share of Total Current Prod.</u>	<u>Tract Estimated Remaining Prim. of 11-1-64</u>	<u>30 x Tract Share of Total Remaining Prim.</u>	<u>Tract Est. Ultimate Primary Prod.</u>	<u>30 x Tract Share of Total Ultimate Prim.</u>	<u>Tract % Participat-</u>
Continental	Reed A-3	1	28,603	22.47824	513,448	20.89305	1,180,000	16.54769	59.91898
Continental	Reed A-3	1a	3,727	2.92894	64,071	2.60715	241,000	3.37965	8.91574
Moss	Reed	1b	3,959	3.11126	75,595	3.07609	186,500	2.61537	8.80272
Continental	Sanderson B	2	5,600	4.40087	21,093	0.85831	204,500	2.86780	8.12698
Continental	Sanderson B	2a	1,193	0.93755	26,098	1.06197	46,900	0.65770	2.65722
Continental	Hewes	3	1,755	1.37920	4,483	0.18242	45,000	0.63106	2.19268
Continental	Walker	4	1,202	0.94461	7,912	0.32195	44,200	0.61984	1.88640
Continental	Leonard	5	400	0.31435	-0-	0.00000	12,441	0.17446	0.48881
Continental	Argo Leonard	6	310	0.24362	-0-	0.00000	4,831	0.06775	0.31137
Continental	Argo et al	7	1,855	1.45779	13,603	0.55353	58,900	0.82598	2.83730
Two States	Etcheverry	8	2,295	1.80357	10,949	0.44553	115,000	1.61270	3.86180
TOTAL UNIT AREA			50,899	40.00000	737,252	30.00000	2,139,272	30.00000	100.00000

Exhibit 1-1
June 28, 1966

Top of Queen

COMPANY: CONTINENTAL OIL COMPANY		LOCATION
WELL: REED A-3 NR 15		
FIELD: EUMONT		
COUNTY: LEA STATE: N.M.		
LOCATION: 1550' E 1/2 - 310' N 1/2 - SEC. 3		FILE NO.
T-10-S, P-16-E		LOG NO. 45814
LOG MEAS FROM 10' ABOVE GROUND LEVEL REEV 3671		
DEIG MEAS FROM 10' ABOVE GROUND LEVEL REEV 3629		
PEEM DATUM GROUND LEVEL REEV 3615		
DATE OF LOG	5/2	5/4
RUN NO	ONE	ONE
DATE	4-7-58	4-7-58
TOTAL DEPTH OF WELL	4000	4000
EFFECTIVE DEPTH OF WELL	3595	3595
EFFECTIVE DEPTH OF WELL	3595	3595
TOP OF LOGGED INTERVAL	SURF.	SURF.
BOTTOM OF LOGGED INTERVAL	3592	3593.5
TYPE OF FLUID IN HOLE	OIL	OIL
NEED LEVEL	FULL	FULL
SOURCE STRENGTH & TYPE	S10A3	S10A3
SOURCE SPACING	13.5	13.5
DETECTOR CLASS	SCINT.	SCINT.
DETECTOR TYPE	GM	GM
DETECTOR LENGTH	4	4
ODI OF INSTRUMENT	3 5/8	3 5/8
TIME CONSTANT SEC.	2.0	2.0
LOGGING SPEED FT MIN.	30-60	30-60
STATISTICAL VARIATION	RECORDED	RECORDED
SENSITIVITY REFERENCE	0-933	0-368
RECORDED BY	CARROLL	
WITNESSED BY	MR. ANDERSON	

CASING RECORD				INTERVAL	
PIPE SIZE	CASING	WT LB.	FROM WELL RECORD	FROM RA LOG	
5 1/2"	5 1/2"		SURF. TO 314	TO	
			SURF. TO 3255	TO	
			TO	TO	

REMARKS

Reproduced By
West Texas Electrical Log Service

Dallas 2, Texas

REFERENCE A7670E

7 COMPLETION RECORD

SPUD DATE

COMP DATE

DST RECORD

CASING RECORD

PERFORATING RECORD

2010 1040 8-07

Top of Grayburg

RD 3993.5
T.O. 3995
CONTINENTAL OIL COMPANY
REED A-3 NR 15
EUMONT
LEA CO., NEW MEXICO

EXHIBIT NO. 3

REED-SANDERSON UNIT - INJECTION WELL DATA

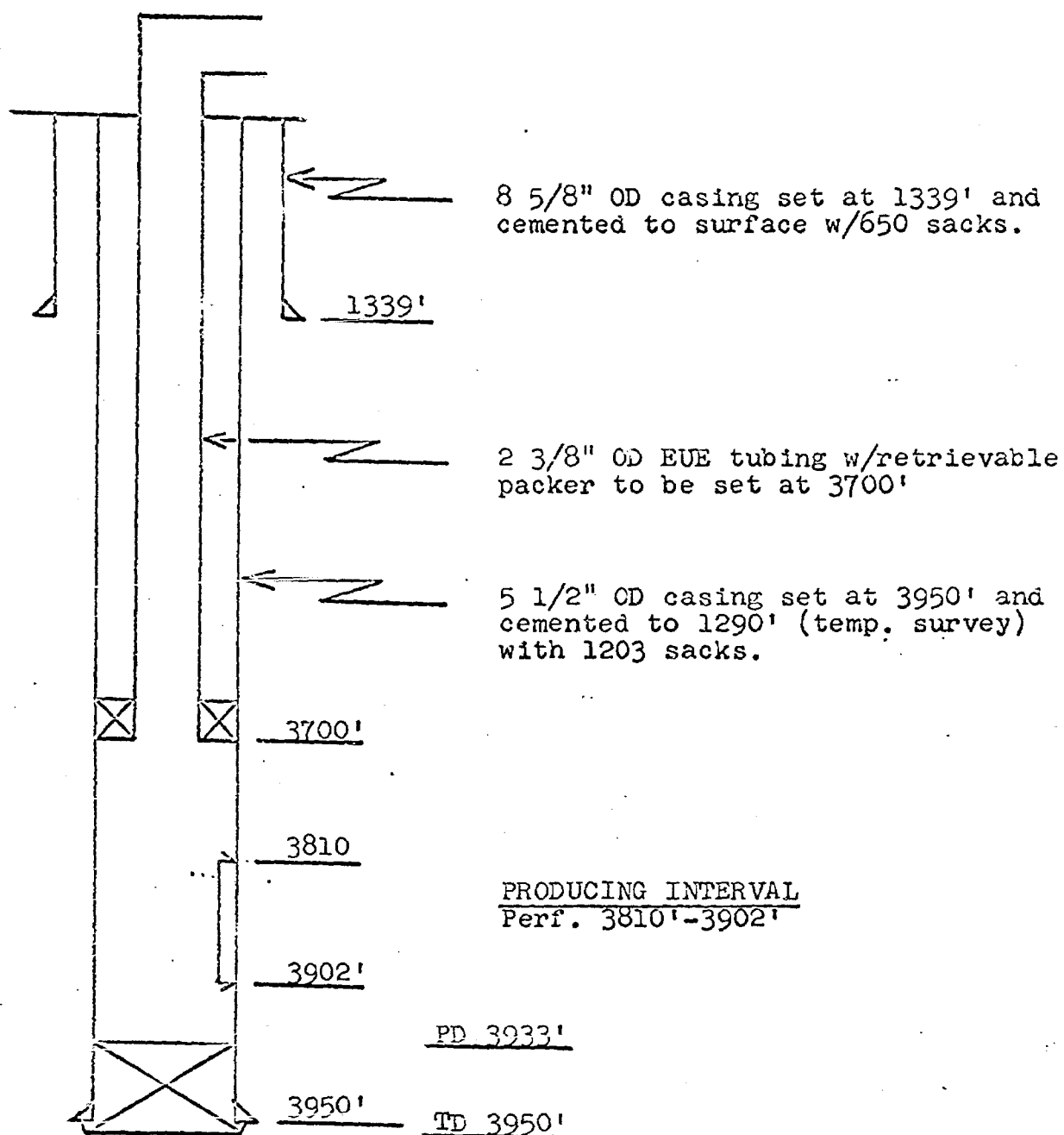
EXHIBIT 4

Company, Lease and Well No.	Total Depth and/or PBD	SURFACE CASING			PRODUCTION CASING			PRODUCING INTERVAL Perforations/OH
		Size	Depth	Cement	Size	Depth	Cement	
<u>CONVENTIONAL OIL COMPANY</u>								
Reed A-3 No. 7 660' FNL&1980' FWL Sec. 3-20-36	3950' / 3933'	8 5/8"	1339'	650	5 1/2"	3950'	1203	3810'-3902'
Reed A-3 No. 9 1980' FNL&660' FWL Sec. 3-20-36	4010' / 4000'	8 5/8"	1372'	600	5 1/2"	4009'	1402	3914'-36', 3946-78', 3968-98'
Reed A-3 No. 10 1980' FSL&FWL Sec. 3-20-36	3950' / 3946'	8 5/8"	1334'	650	5 1/2"	3949'	1045	3806-46', 3862'-82', 3888-98', 3910-30'
Reed A-3 No. 13 660' FSL&660' FWL Sec. 3-20-36	4000' / 3992'	8 5/8"	334'	225	5 1/2"	3999'	1530	3793-3810, 3824-46', 3860-76', 3888-5, 390', 3944-60', 3972-86'
Reed A-3 No. 14 660' FSL&2310' FWL Sec. 3-20-36	4000'	8 5/8"	318'	250	5 1/2"	3999'	1395	3784-3838', 3848'-82', 3892-3908', 3918-28', 3942-50'
Reed A-3 No. 16 (to be drilled) 1980' FNL&1980' FWL Sec. 3-20-36	3860'	7 5/8"	400'	250	4 1/2"	3860'	400	3790-3860' (overall)
Jim Hewes No. 2 1980' FSL & 660' FWL Sec. 4-20-36	4100' / 4092'	8 5/8"	343'	250	5 1/2"	4099'	1391	3866-98', 3908-24', 3929-38', 3972-84', 3989-4010', 4026-60'
Leonard No. 3 1980' FNL&660' FWL Sec. 10-20-36	4020' / 4017'	8 5/8"	339'	250	5 1/2"	4019'	1225	3796-3805', 3811-27', 3910-14', 3920-75', 3980-98', 4006-14'
Argo Leonard No. 1 2310' FSL&FWL Sec. 10-20-36	4030'	8 5/8"	300'	200	5 1/2"	4029'	2300	3838-44', 3856-79', 3882-86', 3903-13', 3918-30', 3946-48', 3958-62'
Sanderson B-1 No. 6 660' FNL&1990' FWL Sec. 10-20-36	4060' / 3996'	8 5/8"	325'	225	5 1/2"	4059'	1439	3790-3800', 3810-34', 3870-86', 3902-08', 3917-24', 3928-32', 3954-75'
Sanderson B-4 No. 1 660' FNL&FWL Sec. 4-20-36	4100' / 4090'	8 5/8"	322'	225	5 1/2"	4099'	1308	3894-3910', 3932-58', 4001-08', 4020-50', 4065'-79'
Sanderson B-9 No. 1* 660' FNL&660' FWL Sec. 9-20-36	10640' / 4083'	13 3/8"	634'	650	7"	4099'	125	3950-65', 3981-4007', 4016-27', 4038-48'
<u>TWO STATES</u>								
Etcheverry Well No. 1 2310' FNL&1650' FWL Sec. 10-20-36	3894'	7 5/8"	243'	175	5 1/2"	3684'	250	OH 3684-3894'

*Sanderson B-9 No. 1 also has intermediate casing - 9 5/8" set at 3360' w/1864 sacks cement.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 7
660' FNL & 1980' FWL Sec. 3-20-36
Elev.: BHF - 3616'
DF - 3626'

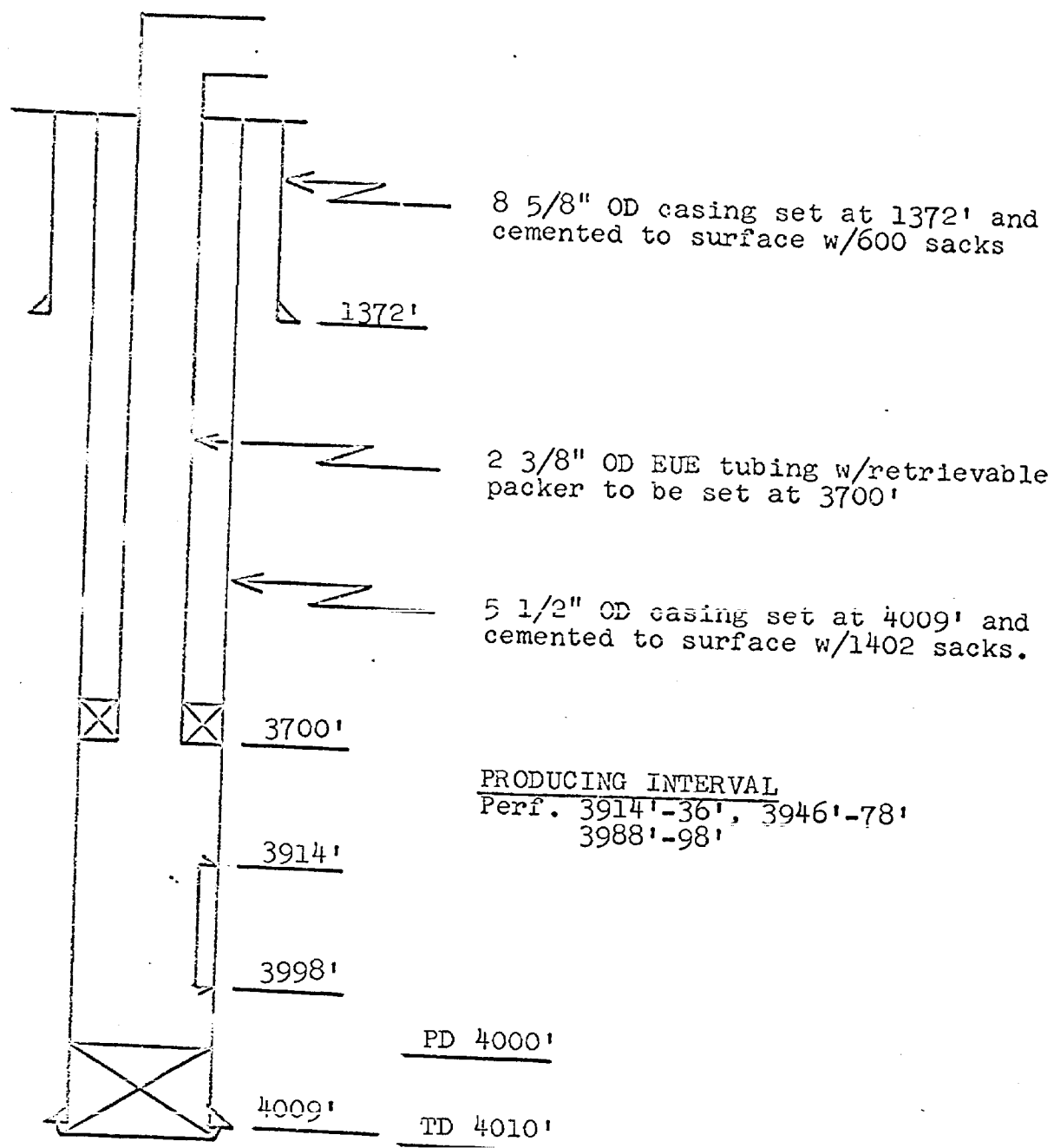


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3910'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 9
1980' FNL & 660' FWL Sec. 3-20-36
Elev.: BHF - 3621'
DF - 3631'

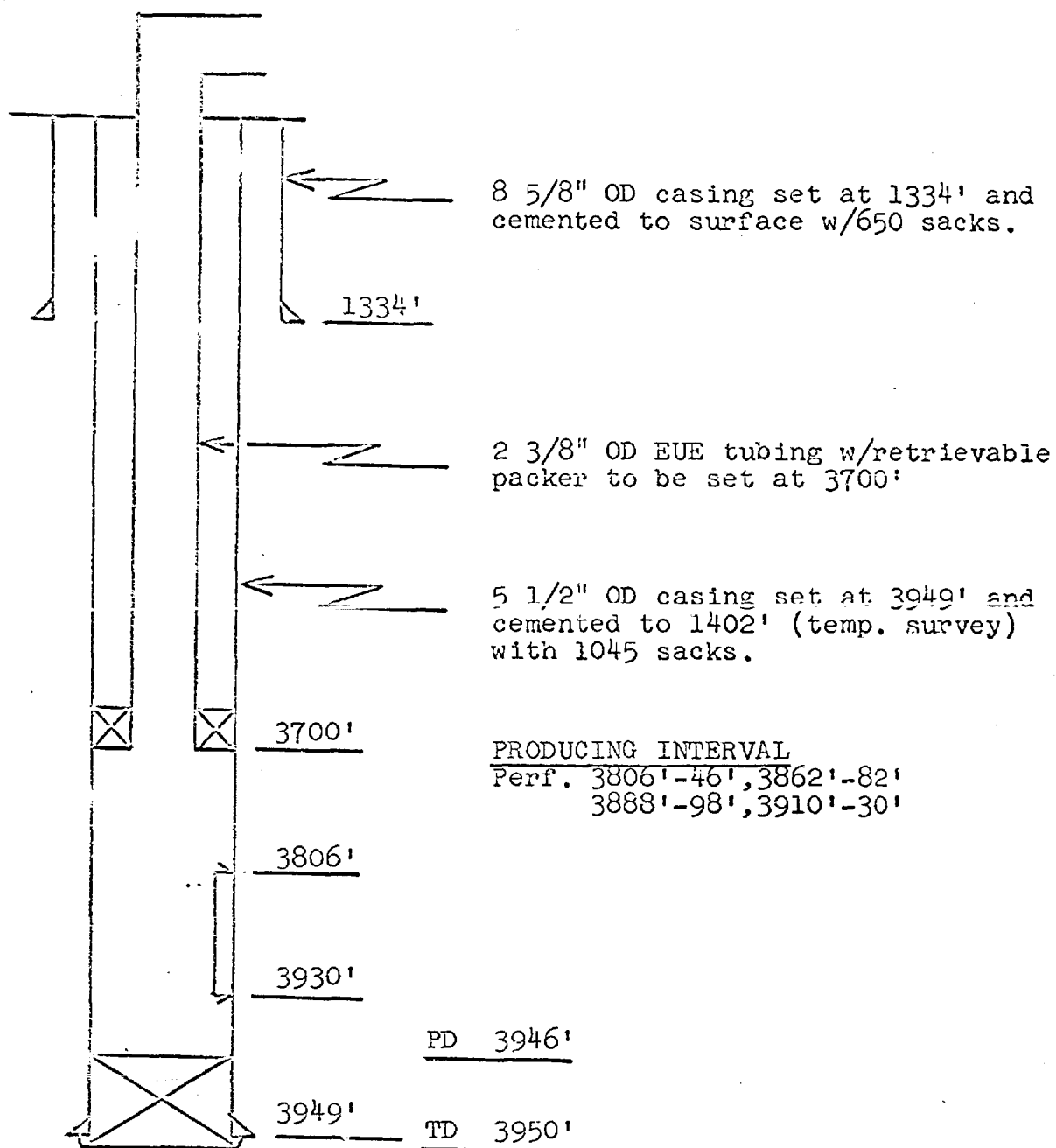


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to PD of 4000'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 10
1980' FSL & FWL Sec. 3-20-36
Elev.: BHF - 3616'
DF - 3626'

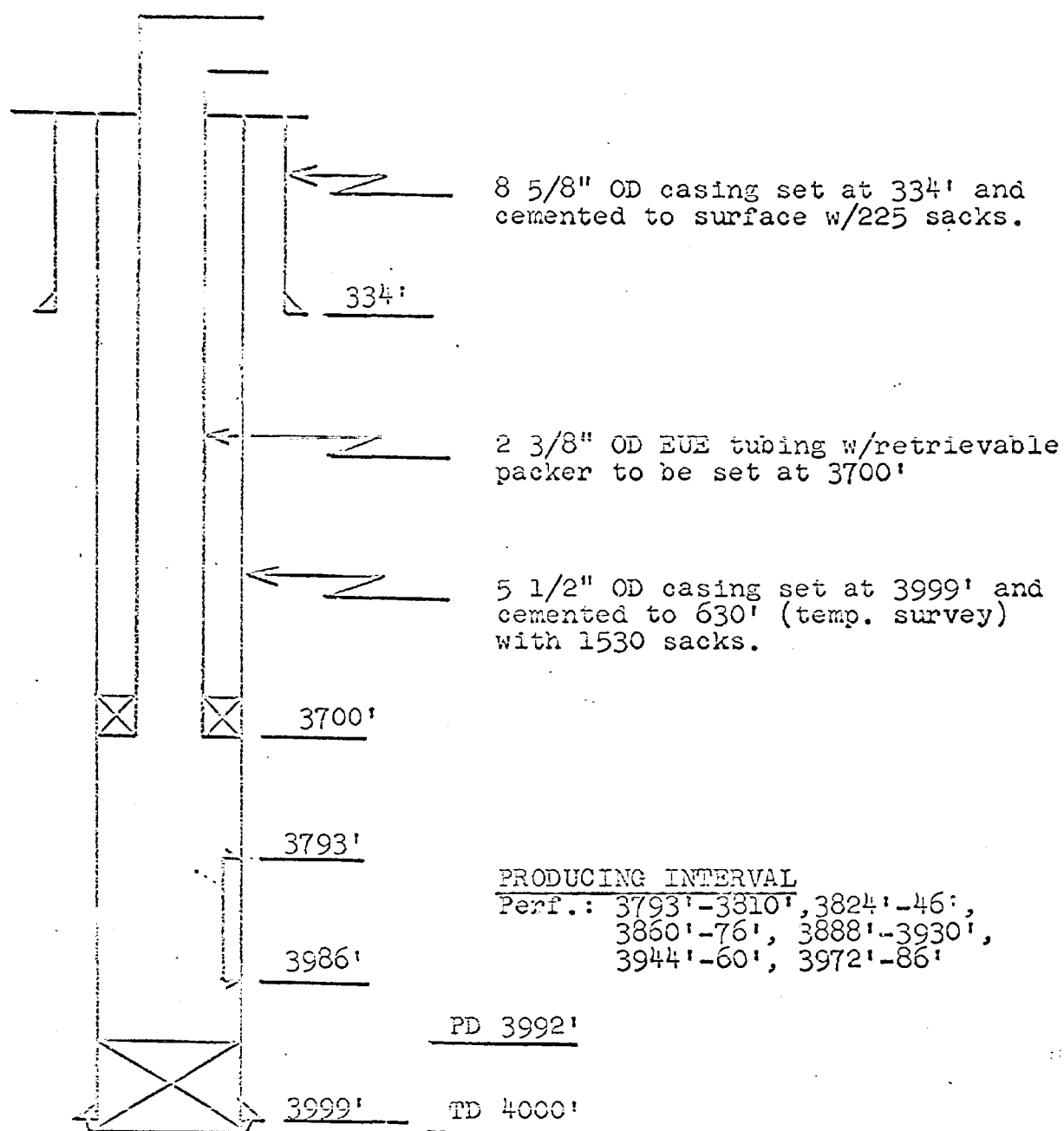


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3935'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 13
660' FSL & 660' FWL Sec. 3-20-36
Elev.: BHF - 3616'
DF - 3626'

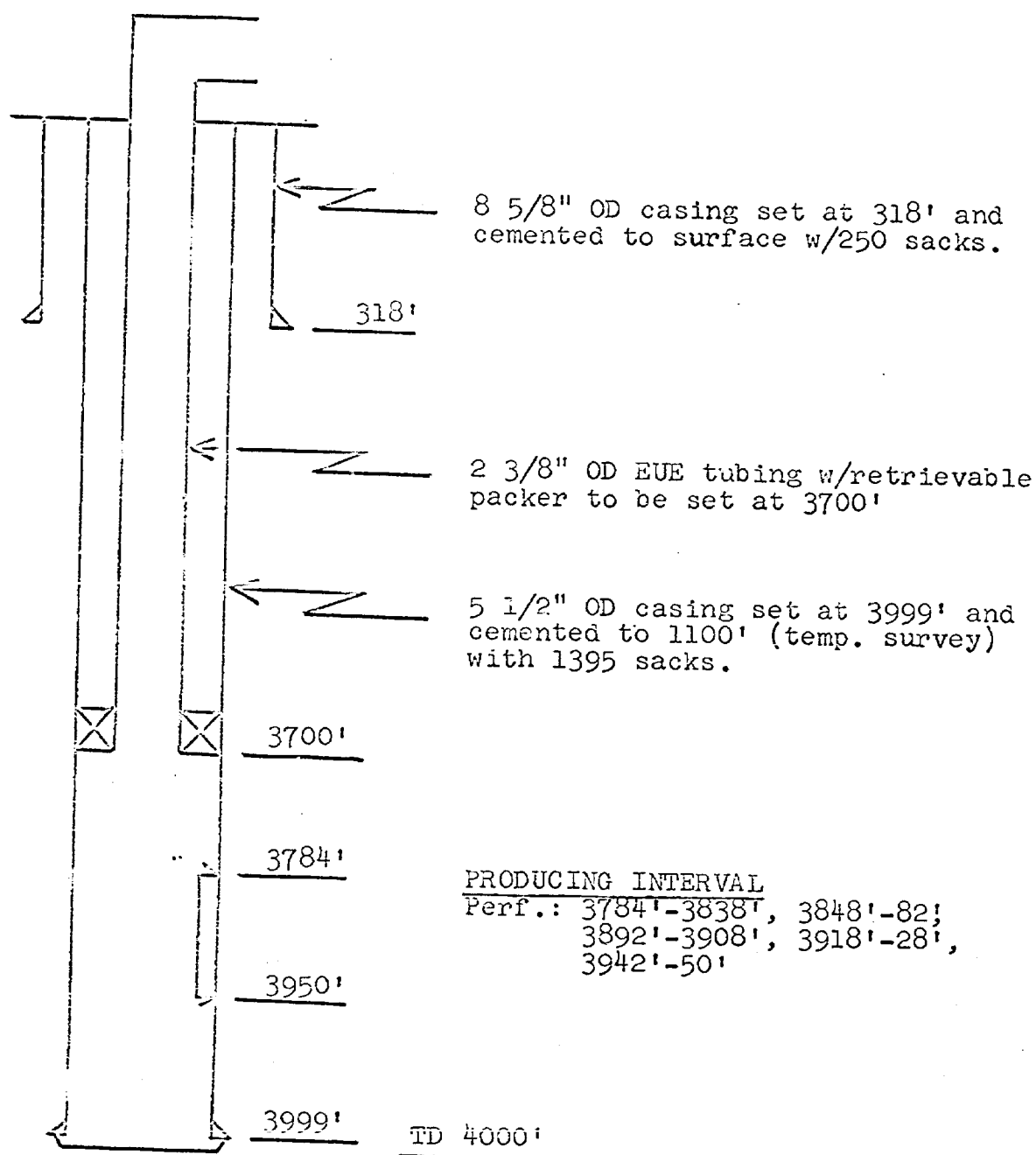


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to PD of 3992'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 14
660' FSL & 2310' FEL Sec. 3-20-36
Elev.: 3609' - BHF
3619' - DF

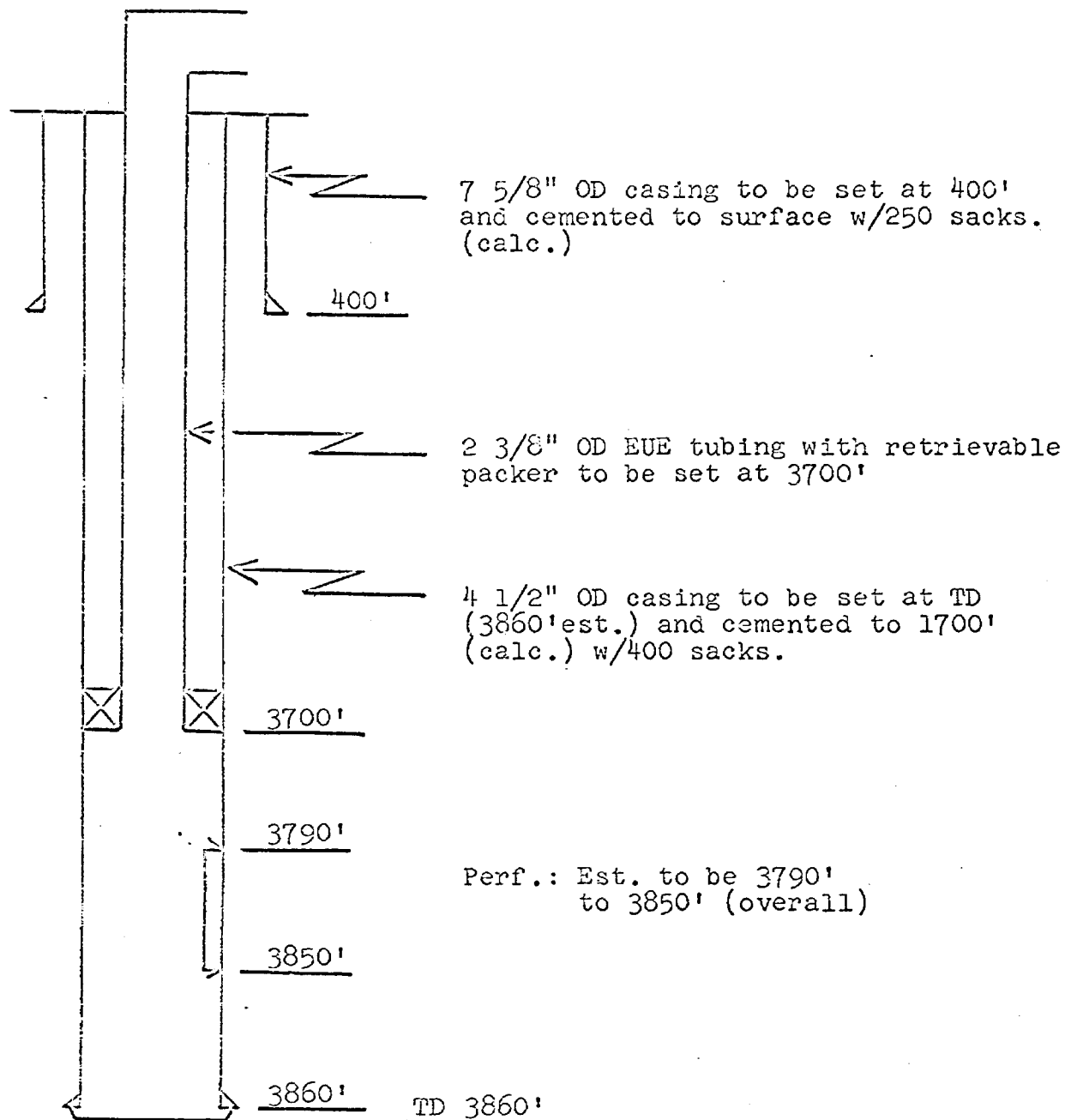


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3950'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Reed A-3 No. 16
1980' FN&EL Sec. 3-20-36
(To Be Drilled)
Elev.: BHP - 3610' (E)
DF - 3620' (E)



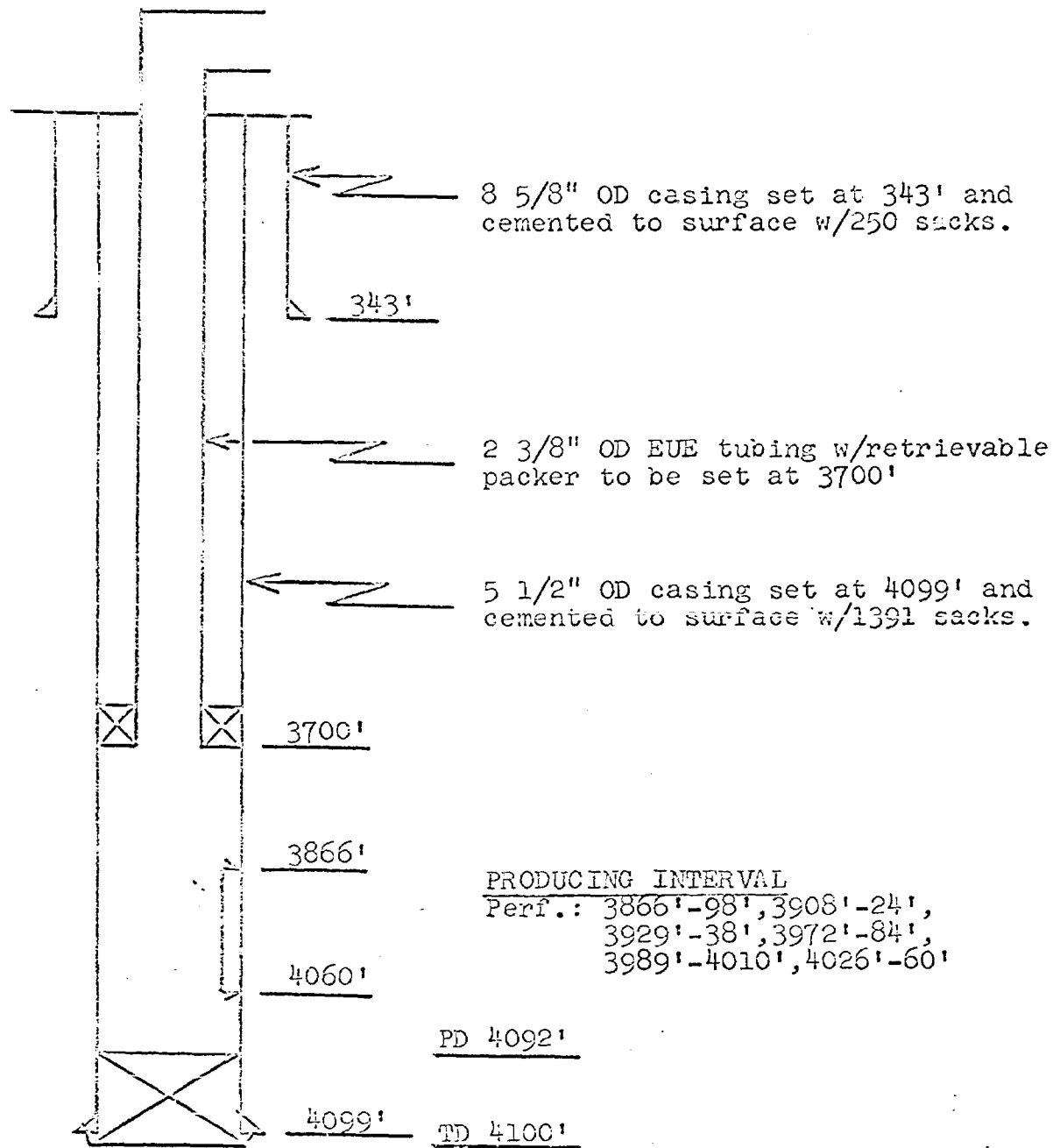
PROPOSED PROCEDURE

After well is completed (production string set and pay zone perforated and stimulated).

1. Run tubing with retrievable packer to be set 90' above top perforated zone (est. 3700').
2. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Jim Hewes No. 2
1980' FSL & 660' FEL Sec. 4-20-36
Elev.: BHF - 3625'
DF - 3635'

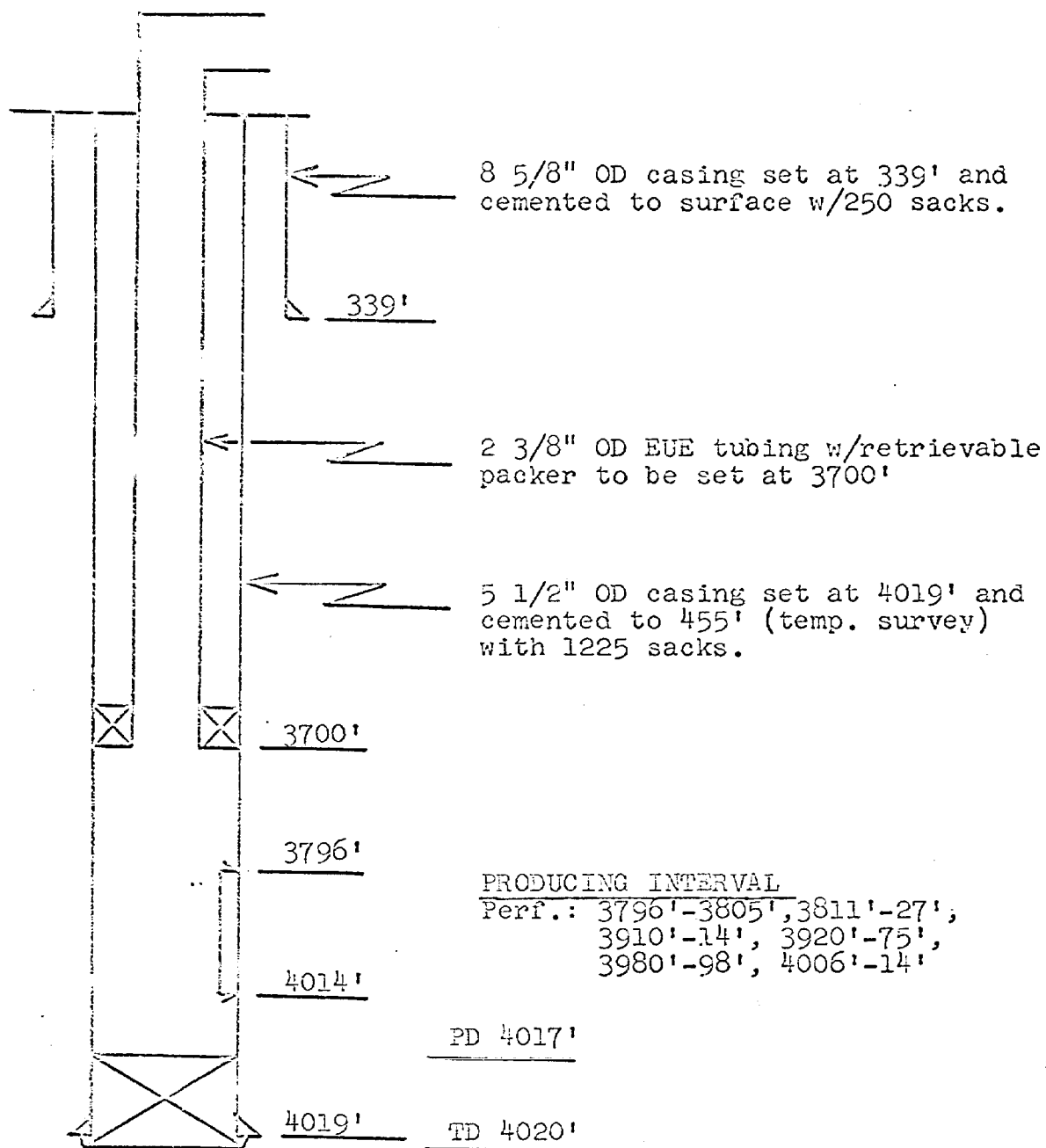


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 4065' (if necessary).
2. Run tubing w/retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Leonard No. 3
1980' FNL & 660' FWL Sec. 10-20-36
Elev.: BMF - 3598'
DF - 3608'

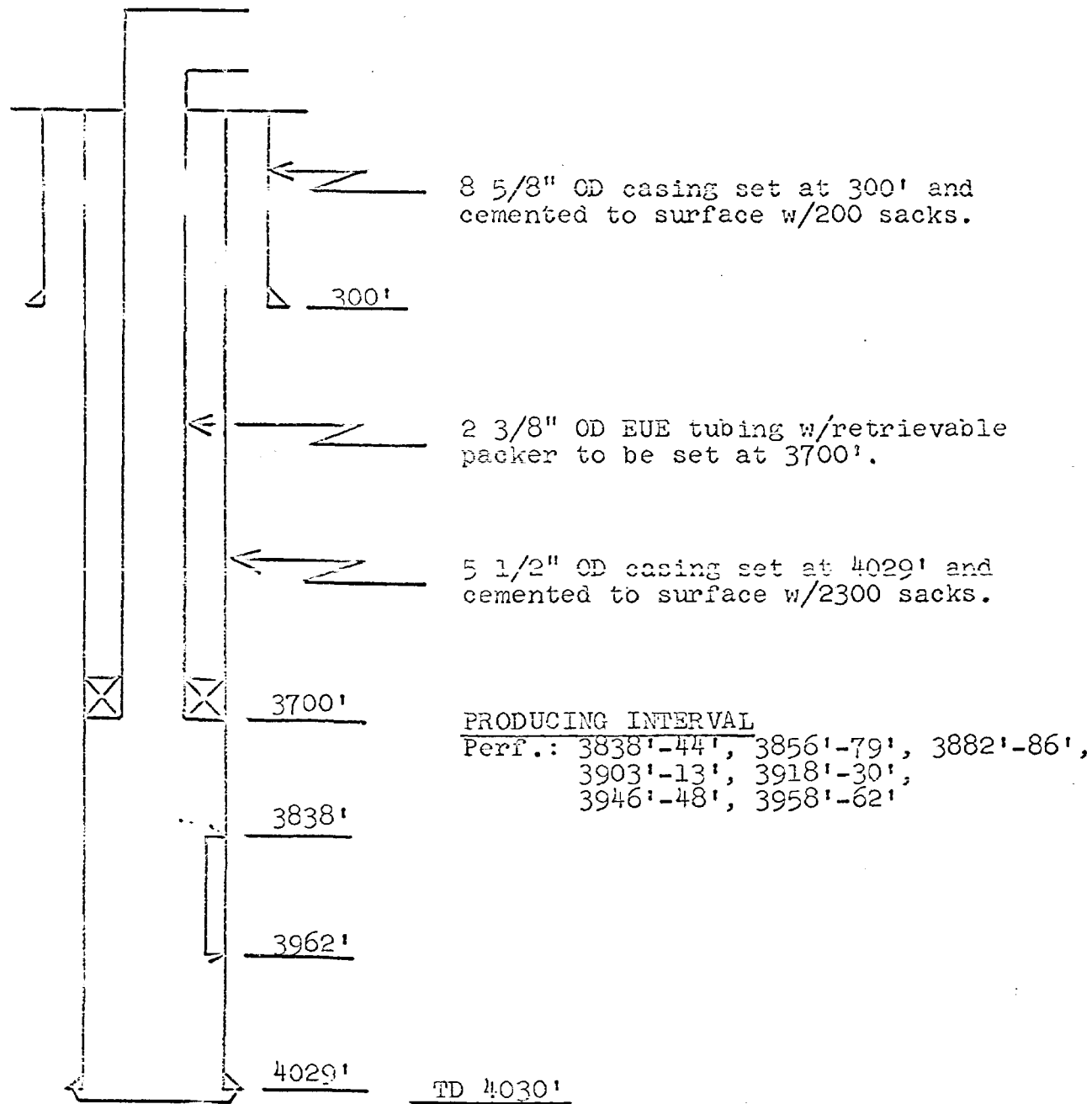


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to PD of 4017'.
2. Run tubing w/retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Argo Leonard No. 1
2310' FSL & 2310' FSL Sec. 10-20-36
Elev.: BHF - 3595'
DF - 3605'

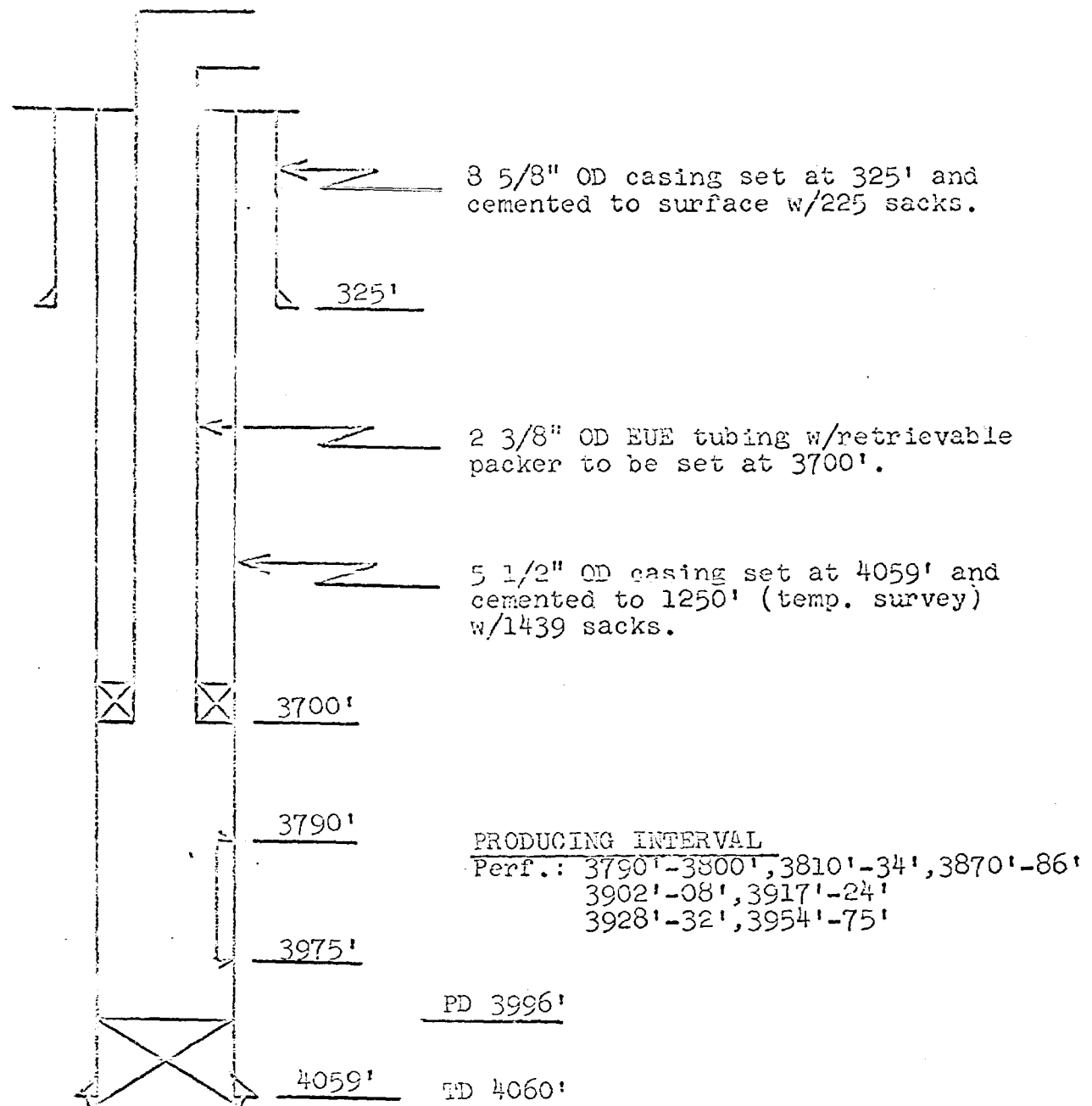


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3970'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Sanderson B-1 No. 6
660' FNL & 1990' FWL Sec. 10-20-36
Elev.: BHP - 3601'
DP - 3609'

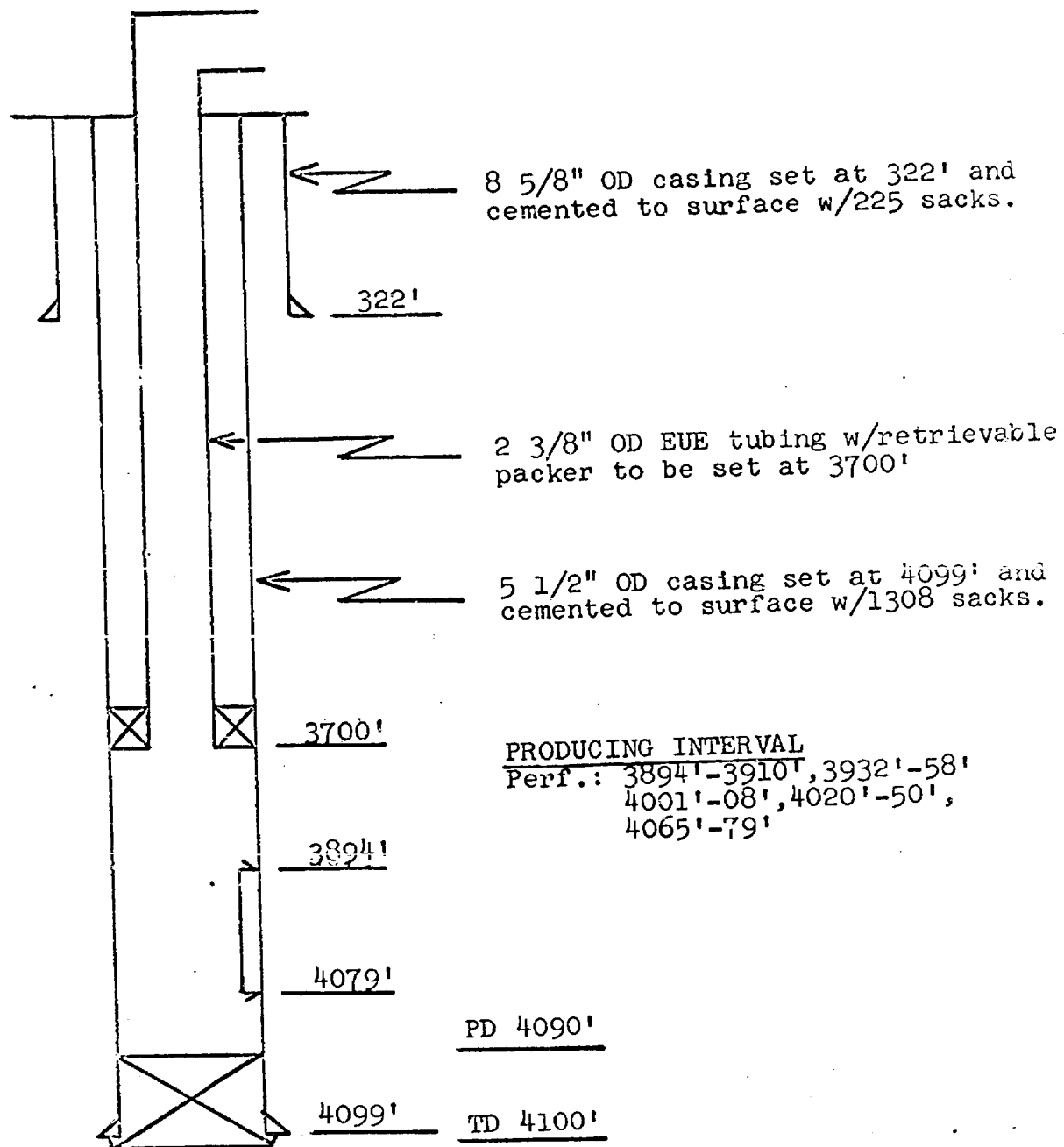


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3980'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Sanderson B-4 No. 1
660' FN&EL Sec. 4-20-36
Elev.: BHF - 3628'
DF - 3638'

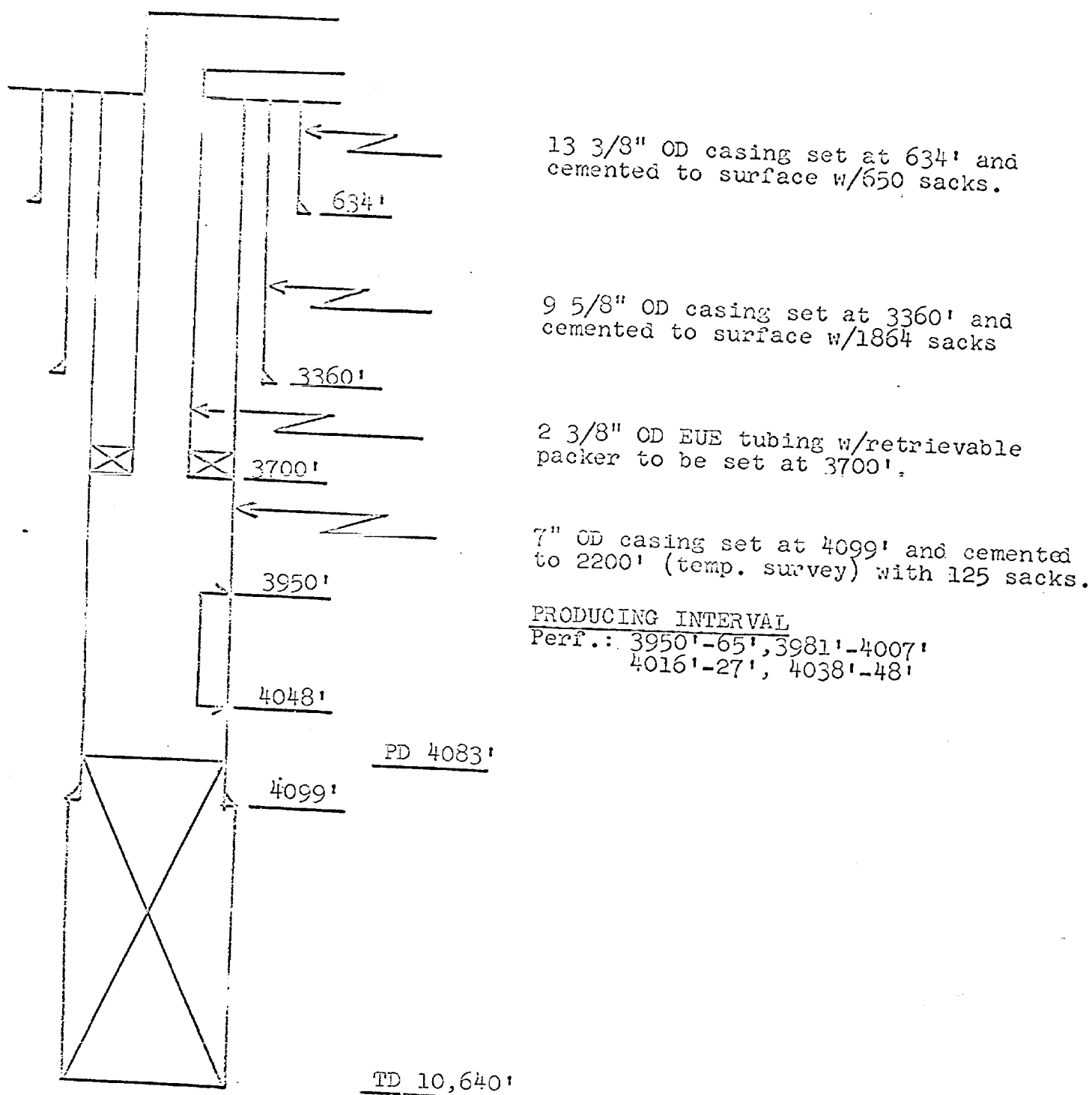


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 4085'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Continental Oil Company
Sanderson B-9 No. 1
660' FNL & 660' FEL Sec. 9-20-36
Elev.: BHF - 3614'
DF - 3626'

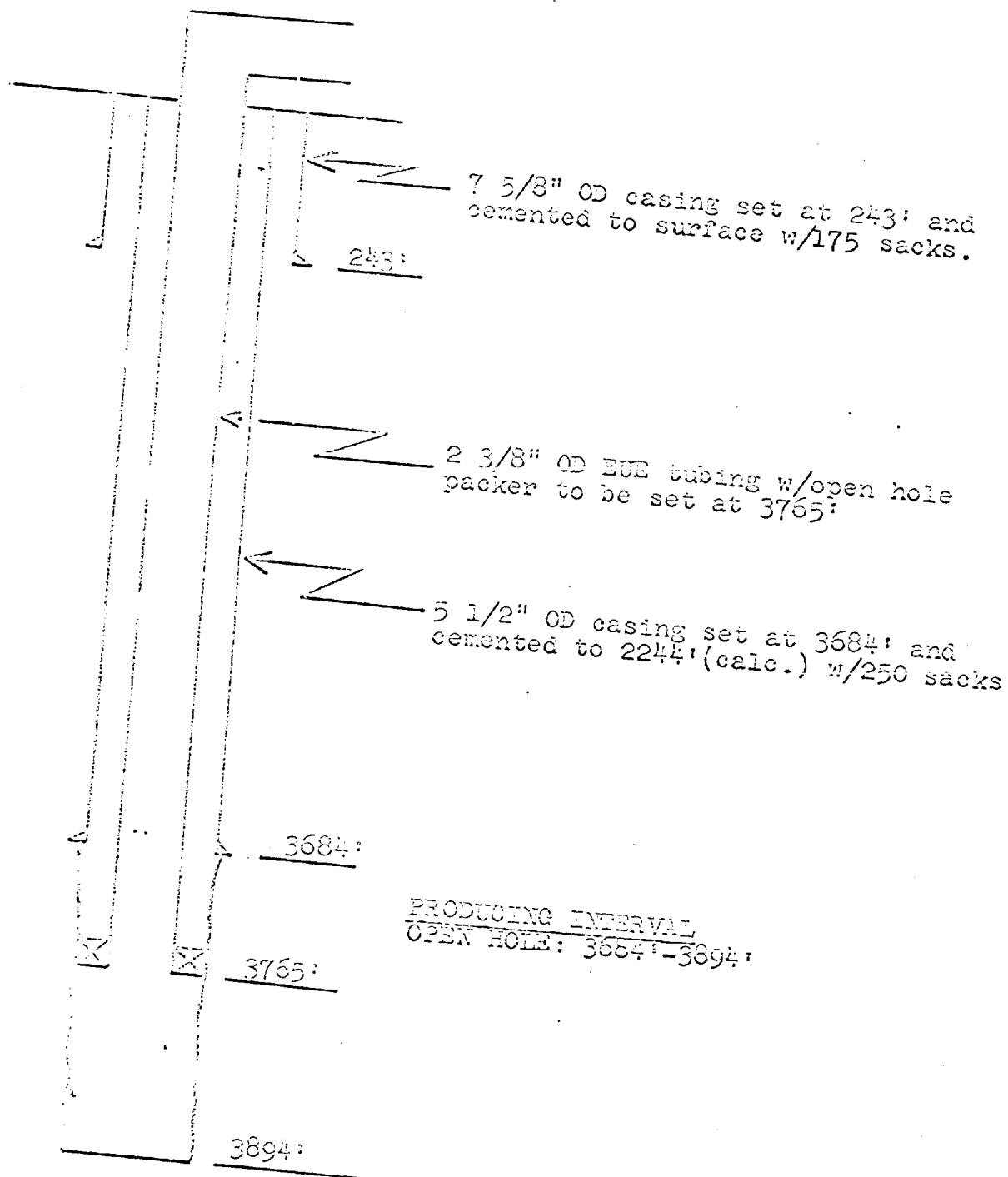


PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 4055'.
2. Run tubing with retrievable packer to be set at approximately 3700'.
3. Connect up well for injection down the tubing.

WATER INJECTION WELL DATA

Two States
Euchevery No. 1
2310' FNL & 1650' FNL Sec. 10-20-36
Elev.: BHT - 3590'
DF - 3600'



PROPOSED PROCEDURE

1. Tag bottom and tally out. Circulate and cleanout to 3894'.
2. Run tubing with open hole packer to be set at approximately 3765' (-165').
3. Connect up well for injection down the tubing.

SUMMARY DATA SHEET

REED-SANDERSON UNIT

General

1. Area, Acres	1040.83
2. Number of Producing Oil Wells	24
3. Number of Plugged and/or Abandoned Wells	2
4. Cumulative Oil Production at 7-1-66, bbls.	1,483,403
5. Average Daily Oil Production Per Well, June 1966, bbls	5.2
6. Average Daily Water Production Per Well, June 1966, bbls	2.9
7. Average Gas-Oil Ratio, June 1966, CF/B	21,800
8. Estimated Life of Waterflood Operation, Years	10

Geological Data

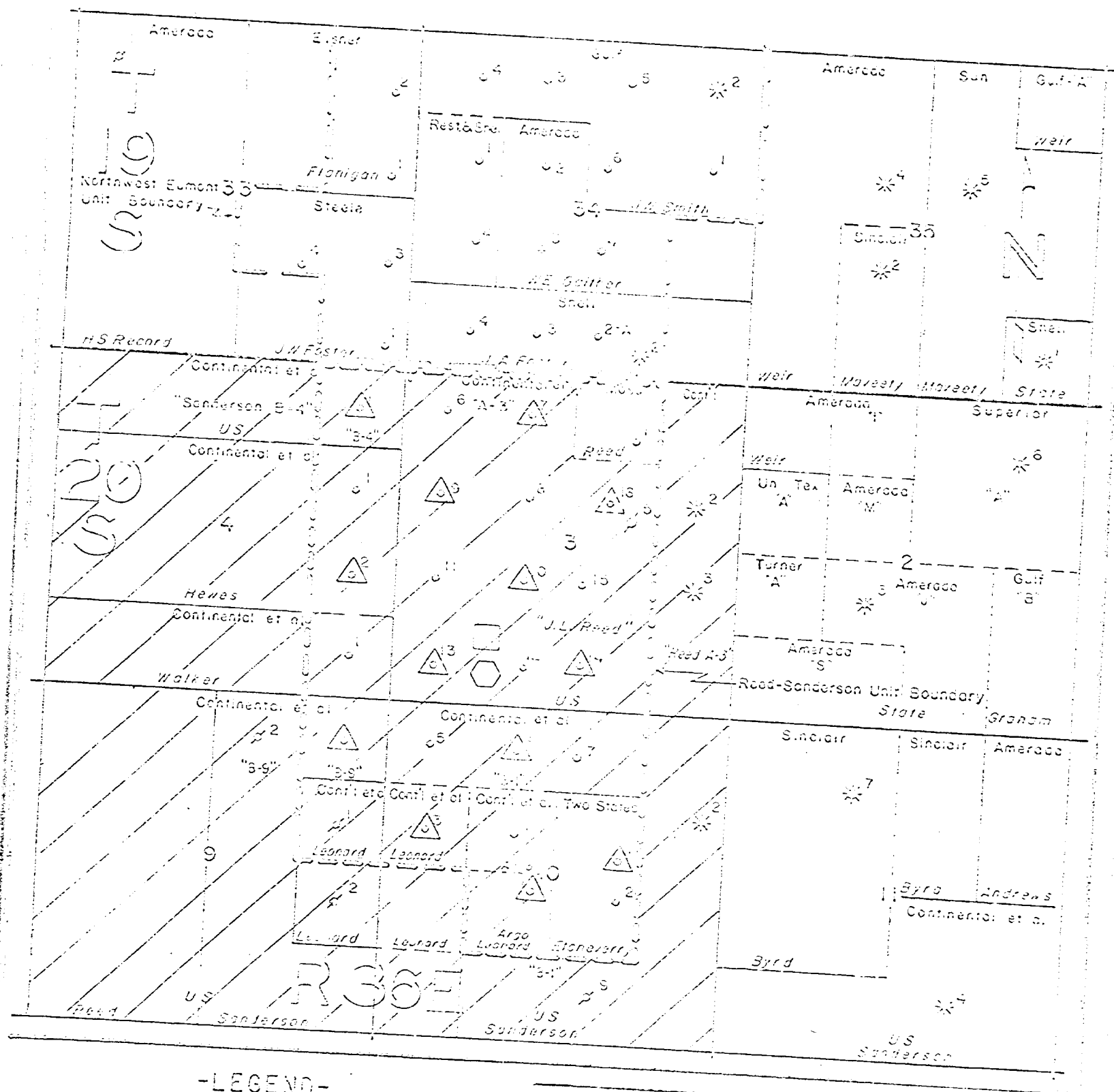
1. Producing Formation	Queen
2. Average Depth, Feet	3,875
3. Type Structure	Flank of Anticline
4. Estimated Gas-Oil Contact, Feet	-150
5. Primary Pore Volume Acre-Feet	14,354
6. Secondary Pore Volume, Acre-Feet	10,389

Reservoir Properties

1. Estimated Original Reservoir Pressure, psi	1,450
2. Estimated Reservoir Pressure, 1-1-67, psi	500
3. Average Rock Properties	
Porosity, Percent	15.4
Permeability (Air), Millidarcies	8.9
4. Reservoir Saturation	
Initial Water, Percent	37
Initial Reservoir Oil, Percent	63
Reservoir Oil Percent, 1-1-67	48.2
Residual Reservoir Oil, Percent (Swept Volume)	30
5. Reservoir Oil Properties	
Estimated Bubble Point Pressure, psi	1,450
Initial Formation Volume Factor	1.230
Waterflood Formation Volume Factor	1.133
Initial Solution GOR, CF/B	499
Initial Oil Viscosity, cp	1.18
API Gravity, Crude	37
6. Estimated Original Stock Tank Oil in Place	
Barrels	8,784,600
Barrels per Acre-Foot	612

Reserves Estimates

1. Estimated Ultimate Primary Recovery, Bbls.	1,627,403
2. Estimated Remaining Primary, 1-1-67, Bbls.	120,000
3. Primary Recovery, Percent of ST Oil in Place 1-1-67	17.1
4. Estimated Waterflood Volumetric Sweep Efficiency	0.55
5. Estimated Waterflood Recovery	
Barrels ST Oil	1,090,000
Barrels ST Oil Per Acre Foot	105
Percent of Initial STO In Place	17.1
6. Estimated Secondary Recovery, ST Bbls. Oil	970,000



-LEGEND-

- Centre Tank Battery
- Water Injection Plant
- Injection Well
- Injection Well To Be Drilled
- Unit Boundary

CONTINENTAL OIL COMPANY
 PRODUCTION DEPARTMENT
 HOBBS DISTRICT
 EUMONT VATES, SEVEN RIVERS,
 QUEEN OIL POOL
 Lea County, New Mexico
 REED-SANDERSON UNIT

Only Eumont Yates, Seven Rivers, Queen (Oil)
 and Eumont Queen (Gas) Wells Shown.

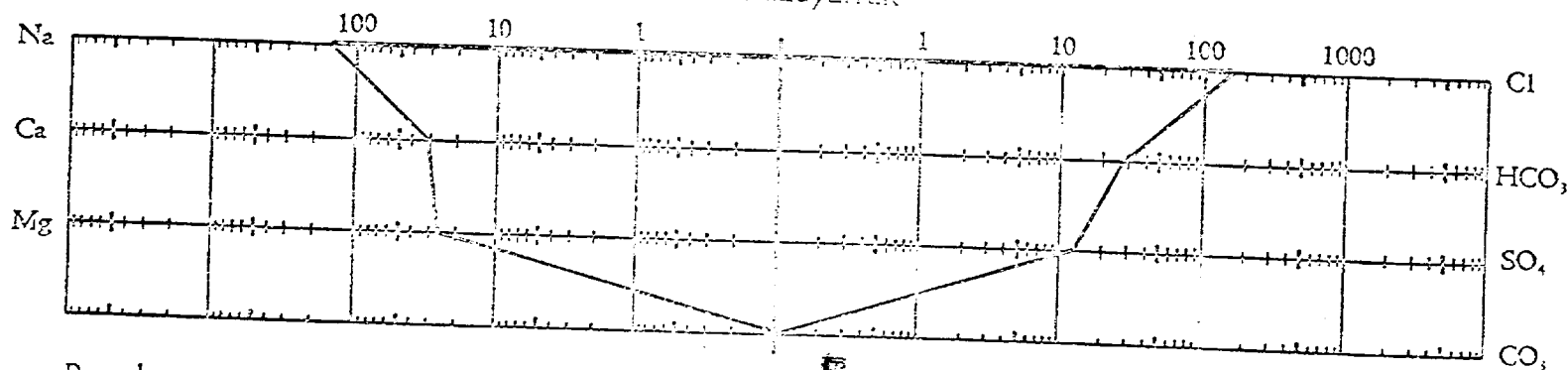
CONTINENTAL OIL COMPANY
PRODUCTION RESEARCH DIVISION
WATER ANALYSIS REPORT

EXHIBIT NO. 9

Company Continental Oil Company Date March 1, 1966 No. W-6622
Well E-M-E SMD-I No. 1 Location
Field E-M-E SMD System Formation Mixture
State New Mexico County Lea Depth
Sample Source Wellhead Date Collected January 29, 1966

Specific Gravity 1.009 Resistivity at 73 °F .550 ohm Meters pH 7.2
meq/L mg/L (ppm) meq/L mg/L (ppm)
Total Dissolved Salts 12.800 Sodium (Na) . . . 153.54 3,530
Hydrogen Sulfide 330 Magnesium (Mg) . . 25.41 305
Chlorides (Cl) 166.11 Calcium (Ca) . . . 30.40 608
Sulfates (SO₄) 13.75 Ba 0
Carbonates (CO₃) 0 Iron (mg/L) Total 0 Dissolved 0
Bicarbonates (HCO₃) 29.18 Suspended Solids . . 23
Free Hydroxyl (OH) 1.780

WATER ANALYSIS PATTERN
SCALE MEC/LITER



Remarks: Sample No. 1 - Analysis for use in Reed Sanderson Unit waterflood

B. M. Casad
B. M. Casad
Supervisor
Production Chemistry Group

Analysis Requested by: R. L. Freeborn
Copies to: MHD-RGP-LPI-JAQ-JLD-NGC-TMA

EXHIBIT NO. 9