THE WESTERN CO.

GAMMATRON

Gamma Ray Neutron Log

COMPANY: CONTINENTAL OIL COMPANY
WELL: REED A-3 # 15
FIELD: EUMONT
COUNTY: LEA STATE: N. MEX.
LOCATION: 1980'FSL-2310'FEL SEC. 3, T-20-S, R-36-E

LOCATION

FILE NO.
LOG NO. 45814

LOG MEAS. FROM: 10' ABOVE GROUND LEVEL ELEV. 3625
DRLG. MEAS. FROM: 10' ABOVE GROUND LEVEL ELEV. 3625
PERM. DATUM: GROUND LEVEL ELEV. 3615

TYPE OF LOG	G/R	N/N
RUN NO.	ONE	ONE
DATE	4-7-58	4-7-58
TOTAL DEPTH (DRILLER)	4000	4000
EFFECTIVE DEPTH (DRILLER)	3995	3995
EFFECTIVE DEPTH (WESTERN)	3995	3995
TOP OF LOGGED INTERVAL	SURF.	SURF.
BOTTOM OF LOGGED INTERVAL	3982	3993.5
TYPE OF FLUID IN HOLE	OIL	OIL
FLUID LEVEL	FULL	FULL
SOURCE STRENGTH & TYPE		S10A3
SOURCE SPACING		13.5
DETECTOR CLASS	SCINT.	SCINT.
DETECTOR TYPE	D4G1	D6N1
DETECTOR LENGTH	4	4
O.D. OF INSTRUMENT IN.	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	D-933	D-368
RECORDED BY	CARROLL	
WITNESSED BY	MR. ANDERSON	

CASING RECORD — INTERVAL —

BIT SIZE	CASING	WT. LB.	FROM WELL RECORD	FROM RA LOG
	8 5/8		SURF. TO 314	TO
7 7/8	5 1/2		SURF. TO 3999	TO
			TO	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

ACID. FRAC SHOT

T.P. G.R.

T.P. C.P.

REMARKS

GAMMA RAY → NEUTRON →

RADIATION UNITS → 4 ←

ENVIRONMENTAL UNITS → 125 ←

Top of Queen

3600

3700

3800

3900

Top of Grayburg

5 1/2" CASING

R.D. 3993.5
T.D. 3995

CONTINENTAL OIL COMPANY
REED A-3 № 15
EUMONT
LEA CO., NEW MEXICO

EXHIBIT NO. 3

REED-SANDERSON UNIT - INJECTION WELL DATA

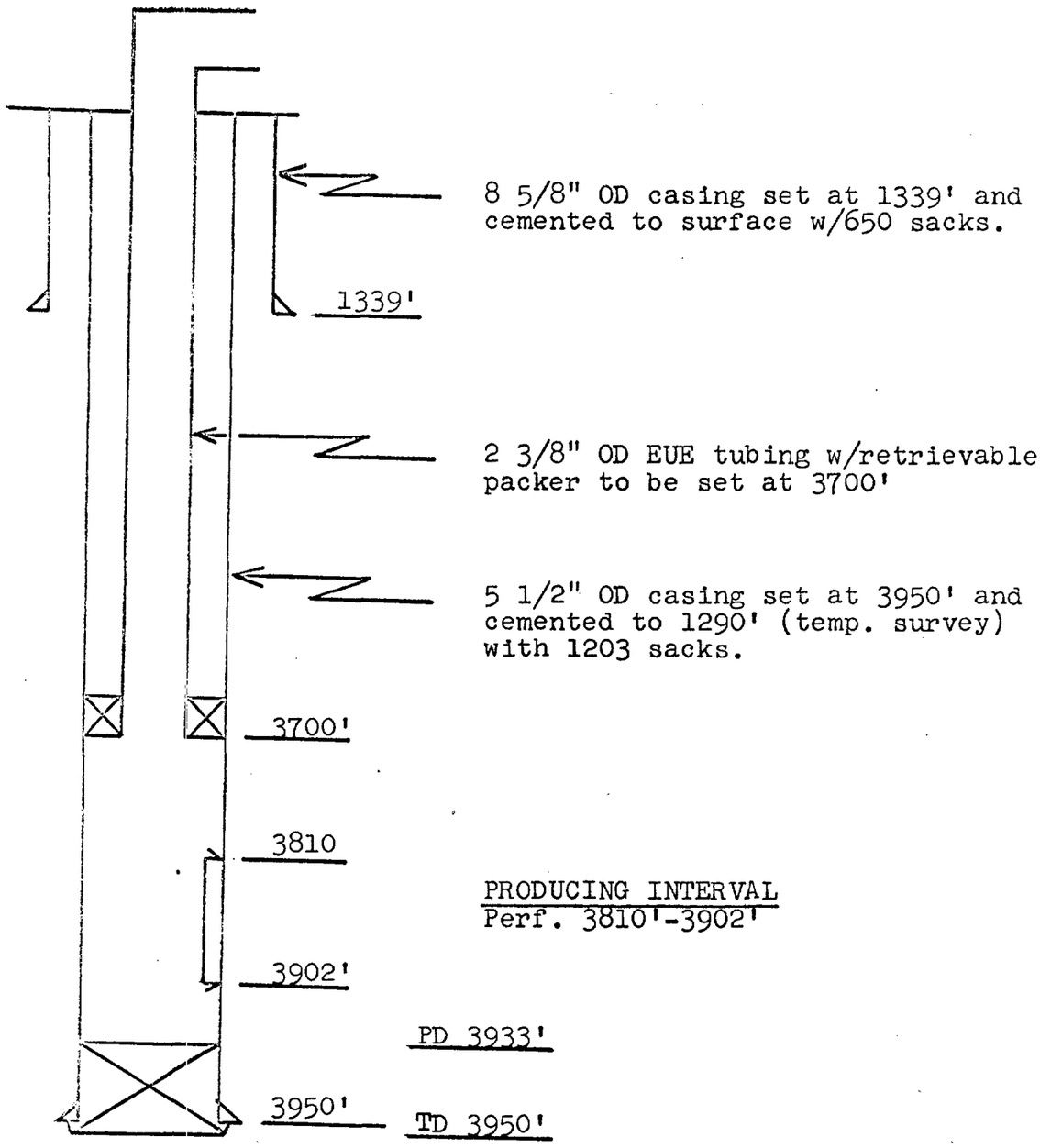
EXHIBIT 4

Company, Lease and Well No.	Total Depth and/or PBD	SURFACE CASING Size	Depth	Cement	PRODUCTION CASING Size	Depth	Cement	PRODUCING INTERVAL Perforations/OH
CONTINENTAL OIL COMPANY								
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',3988-98'
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',3888-3[illegible]0' 3944-60',3972-86'
Reed A-3 No. 14 660'FSL&2310'FEL 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'FEL 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'FEL 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',3903-1[illegible] 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&FEL 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'FEL Sec. 9-20-36	10640'/4083'	13 3/8"	634'	650	7"	4099'	125	3950-65',3981-4007',4016-27',4038-48'
TWO STATES								
Etcheverry Well No. 1 2310'FNL&1650'FEL 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'



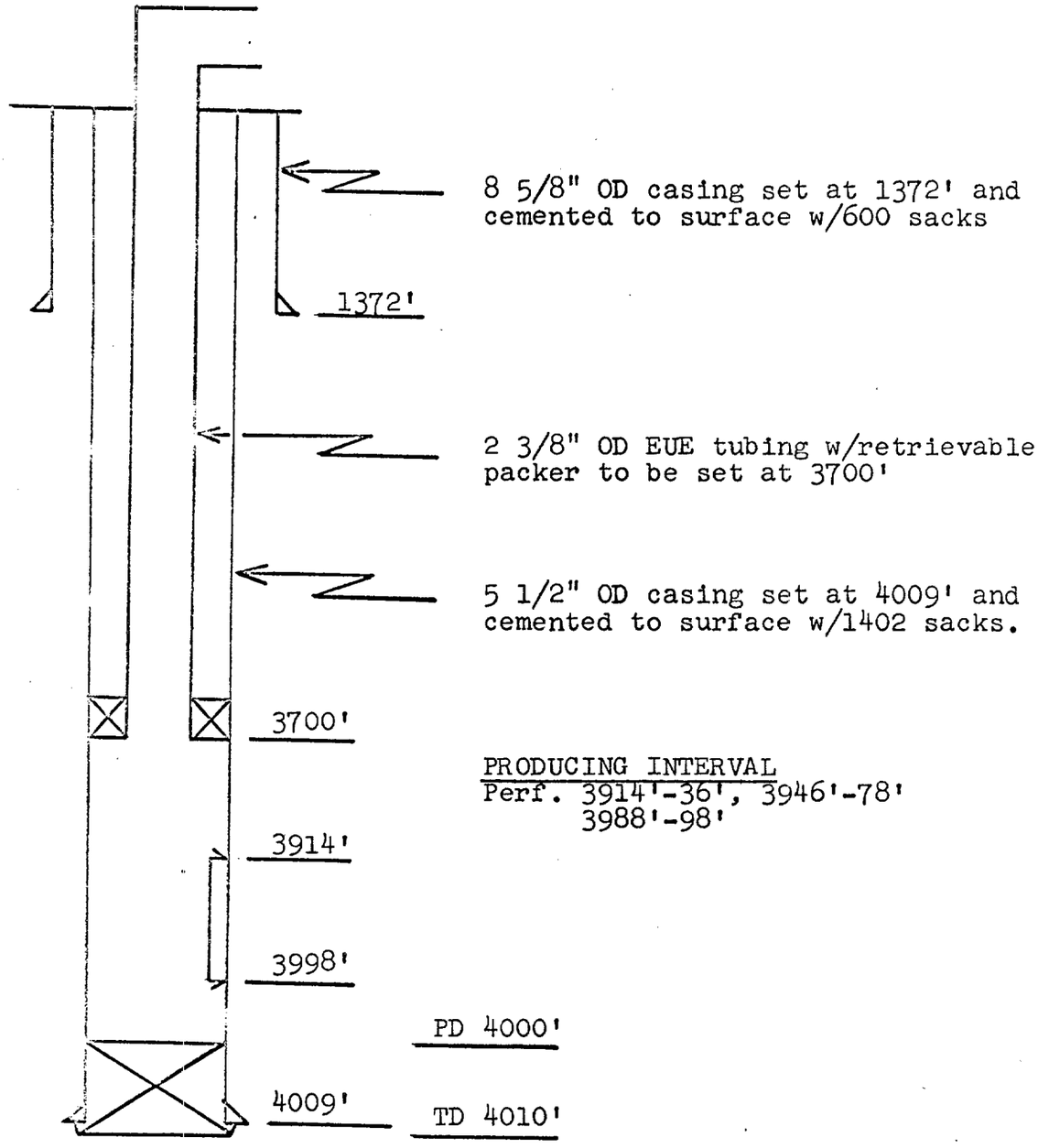
PROPOSED PROCEDURE

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.

EXHIBIT 4-1

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'



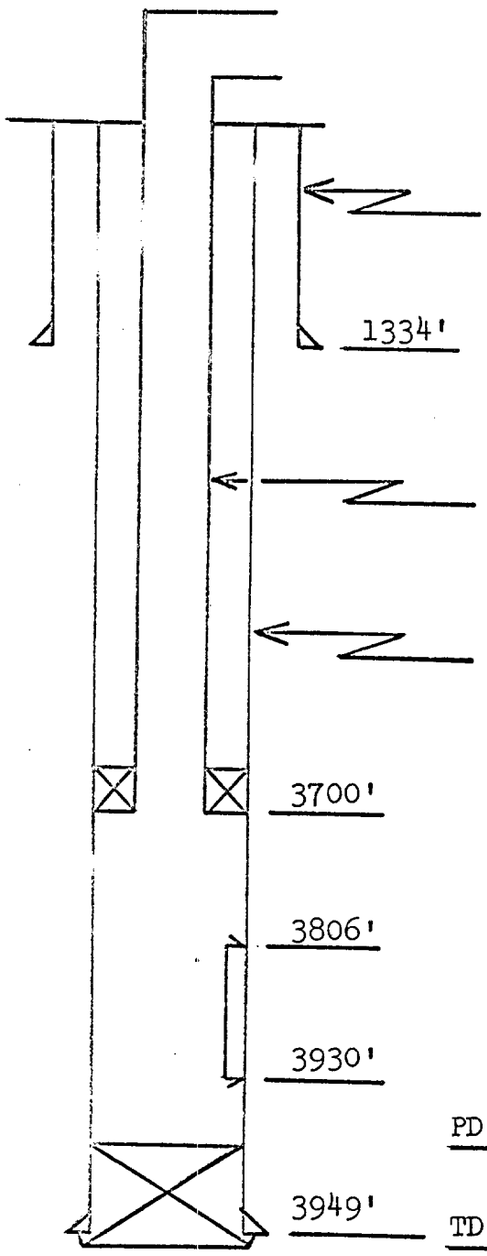
PROPOSED PROCEDURE

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.

EXHIBIT 4-2

WATER INJECTION WELL DATA

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



8 5/8" OD casing set at 1334' and cemented to surface w/650 sacks.

2 3/8" OD EUE tubing w/retrievable packer to be set at 3700'

5 1/2" OD casing set at 3949' and cemented to 1402' (temp. survey) with 1045 sacks.

PRODUCING INTERVAL
Perf. 3806'-46',3862'-82'
3888'-98',3910'-30'

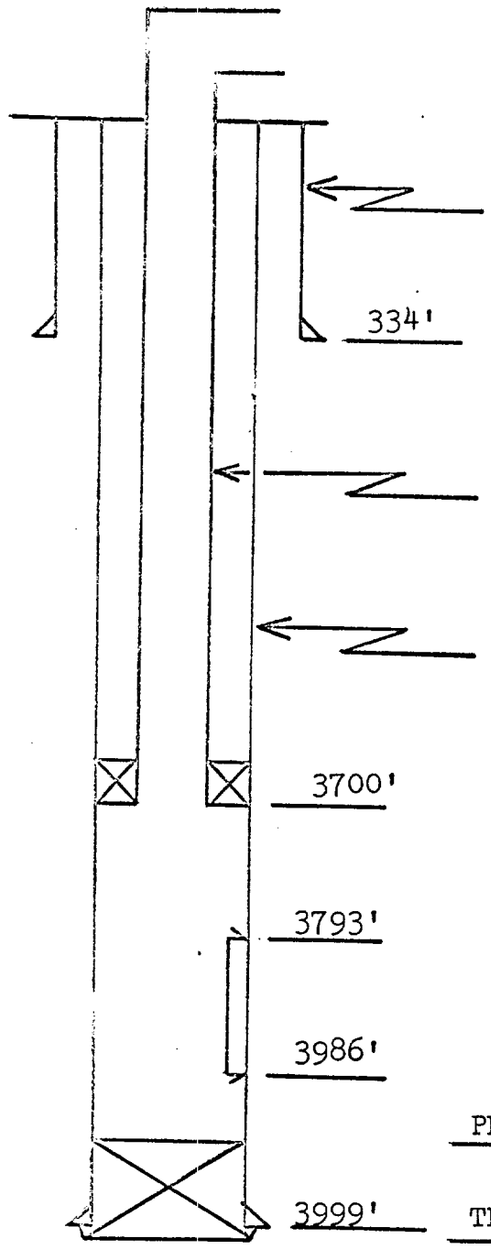
PROPOSED PROCEDURE

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.

EXHIBIT 4-3

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'



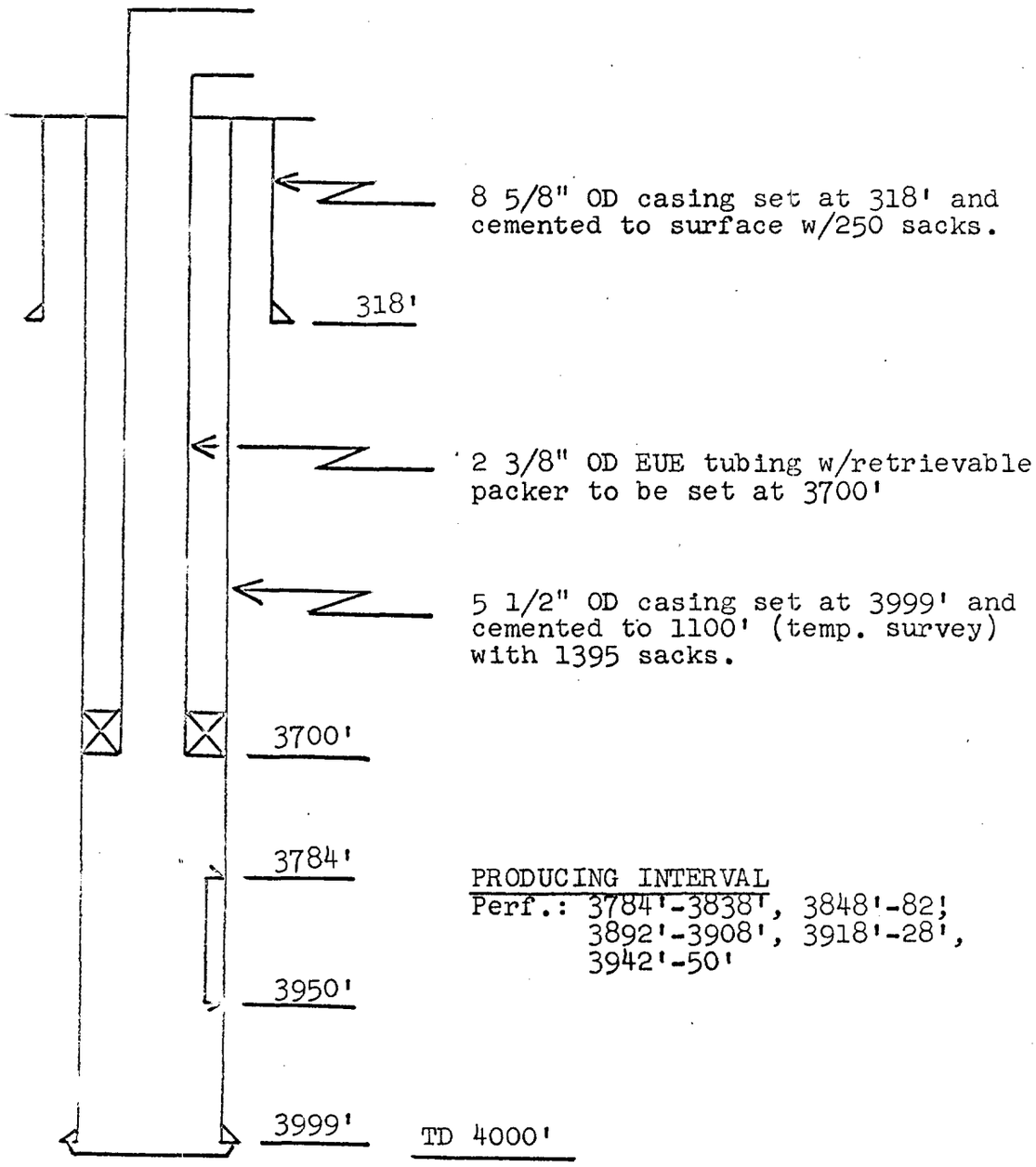
PROPOSED PROCEDURE

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.

EXHIBIT 4-4-

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



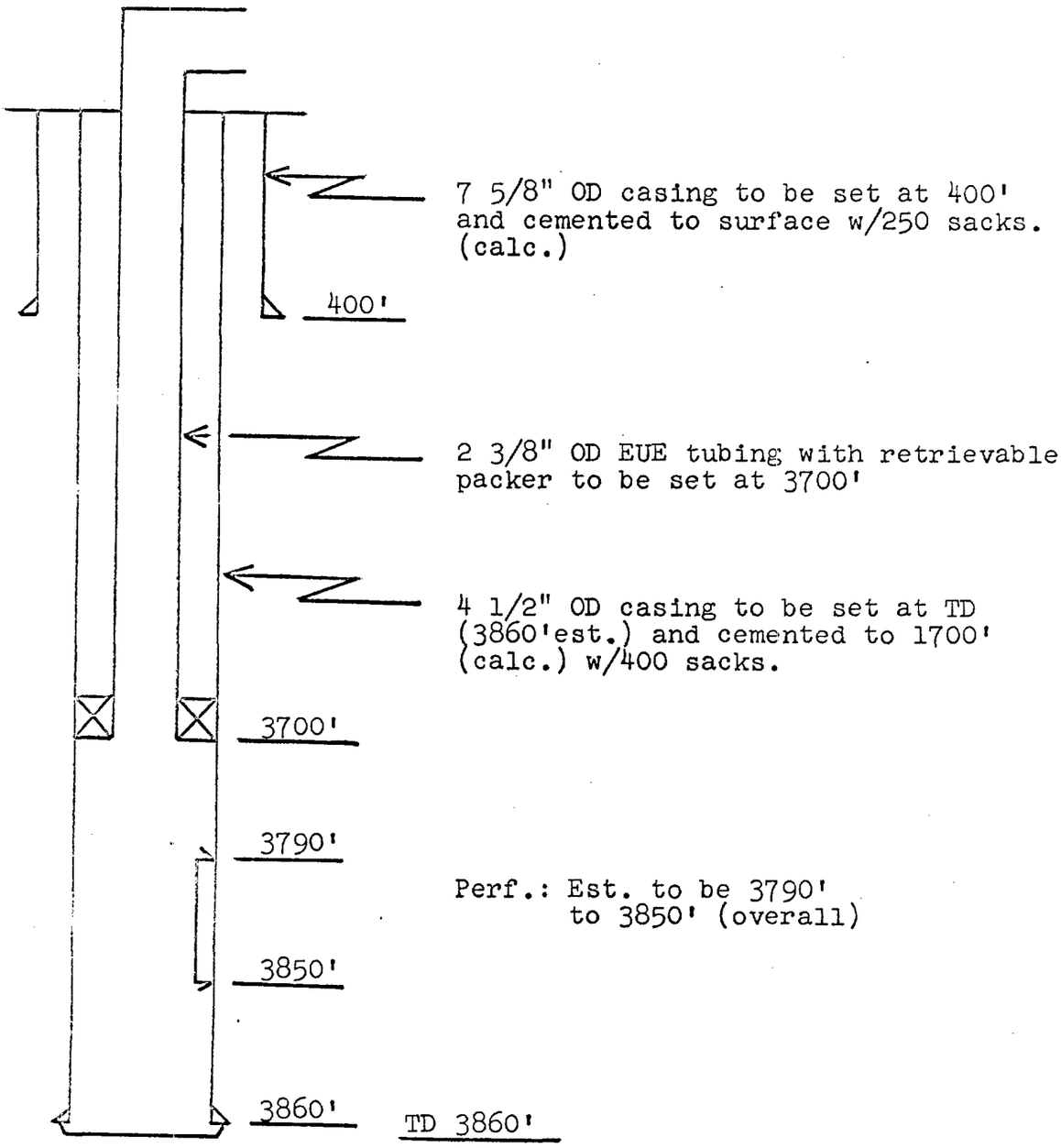
PROPOSED PROCEDURE

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.

EXHIBIT 4-5

WATER INJECTION WELL DATA

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



PROPOSED PROCEDURE

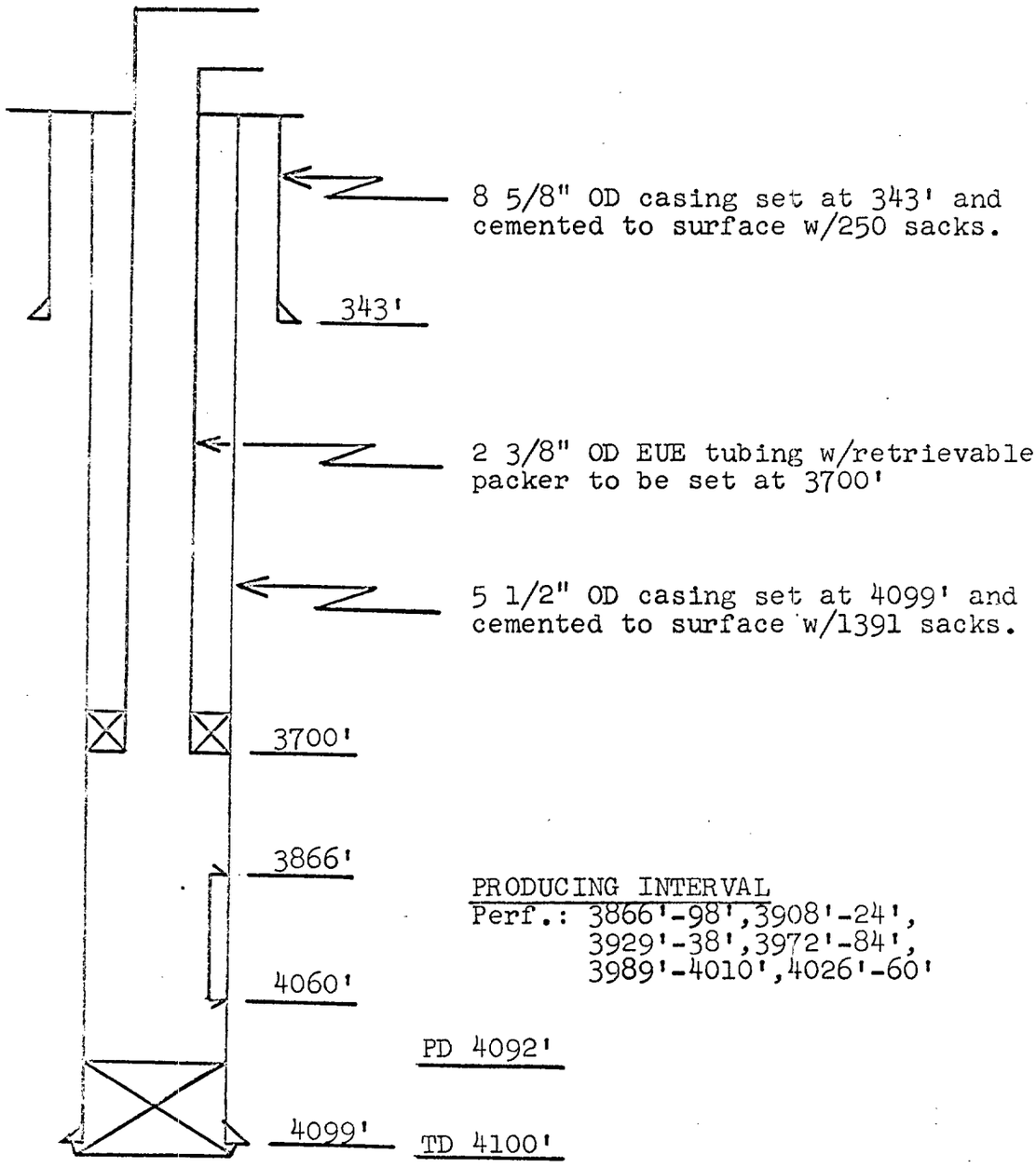
After well is completed (production string set and pay zone perforated and stimulated).

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.

EXHIBIT 4-6

WATER INJECTION WELL DATA

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



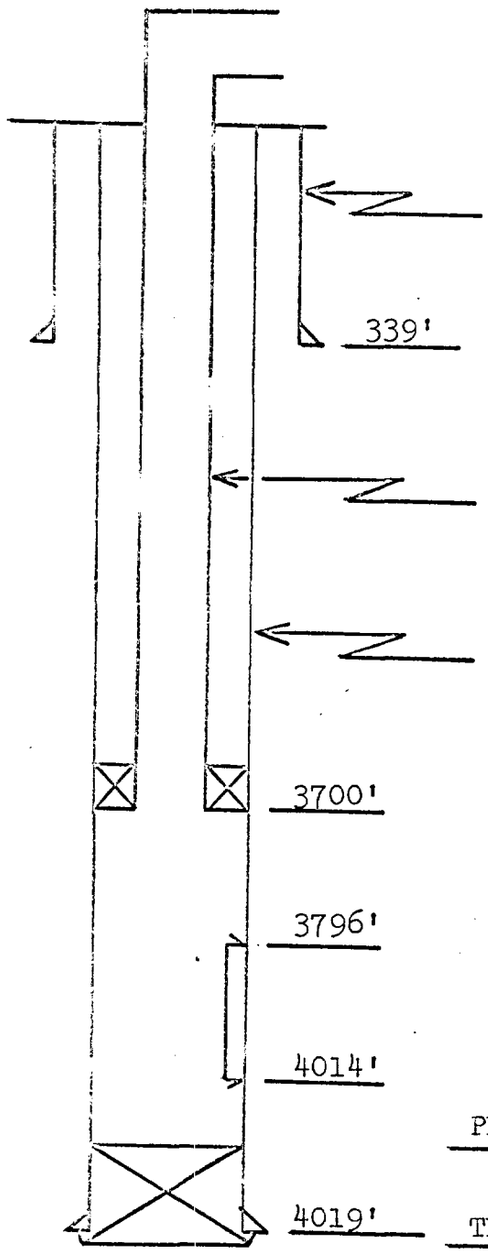
PROPOSED PROCEDURE

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.

EXHIBIT 4-7

WATER INJECTION WELL DATA

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



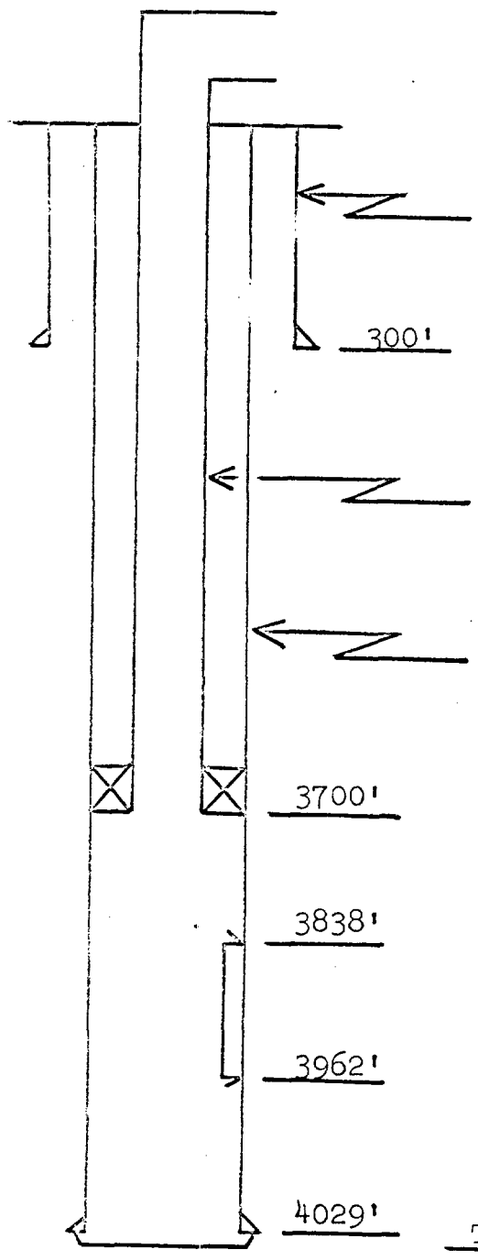
PROPOSED PROCEDURE

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.

EXHIBIT 4-8

WATER INJECTION WELL DATA

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



8 5/8" OD casing set at 300' and cemented to surface w/200 sacks.

2 3/8" OD EUE tubing w/retrievable packer to be set at 3700'.

5 1/2" OD casing set at 4029' and cemented to surface w/2300 sacks.

PRODUCING INTERVAL
Perf.: 3838'-44', 3856'-79', 3882'-86', 3903'-13', 3918'-30', 3946'-48', 3958'-62'

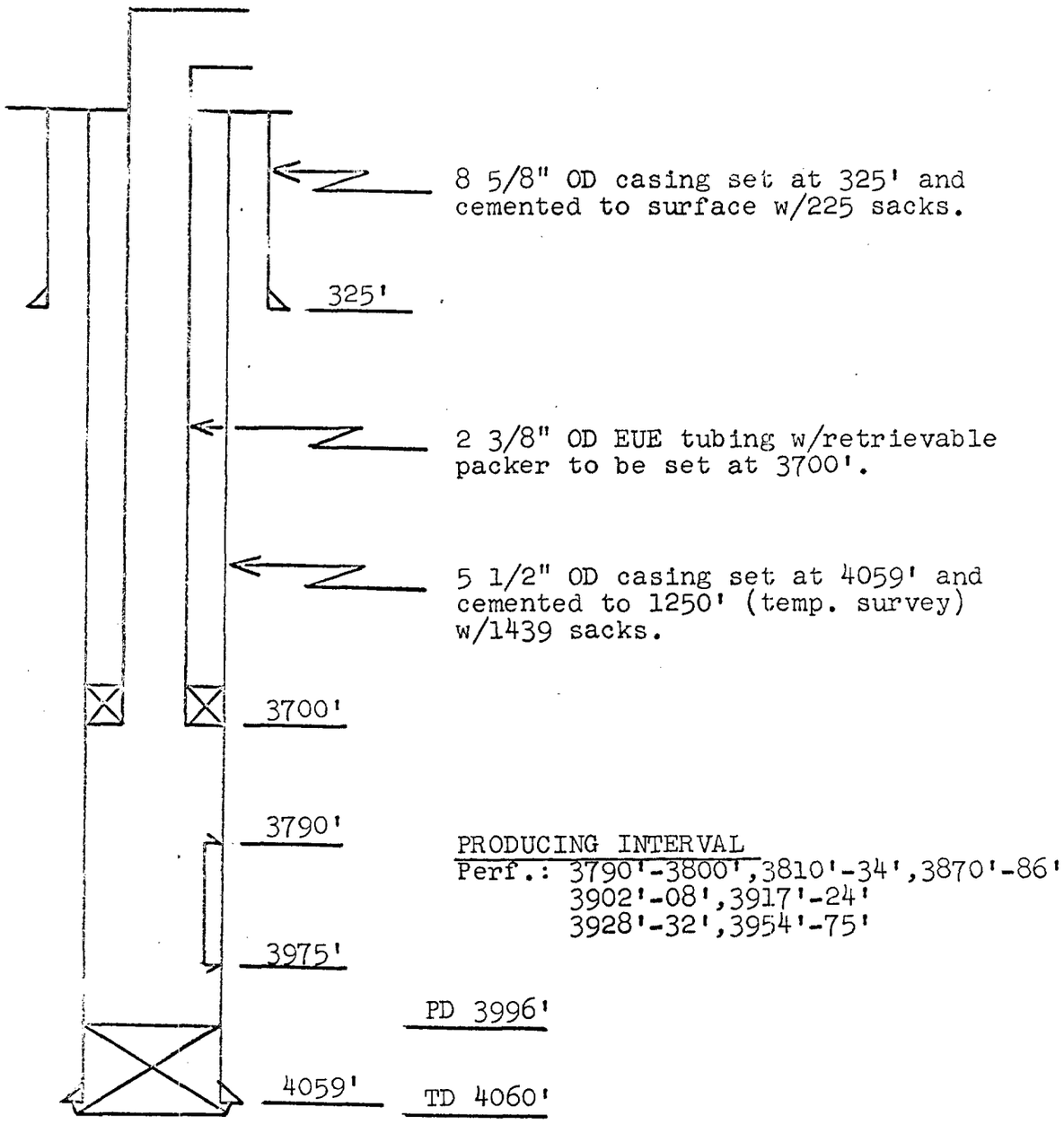
PROPOSED PROCEDURE

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.

EXHIBIT 4-9

WATER INJECTION WELL DATA

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



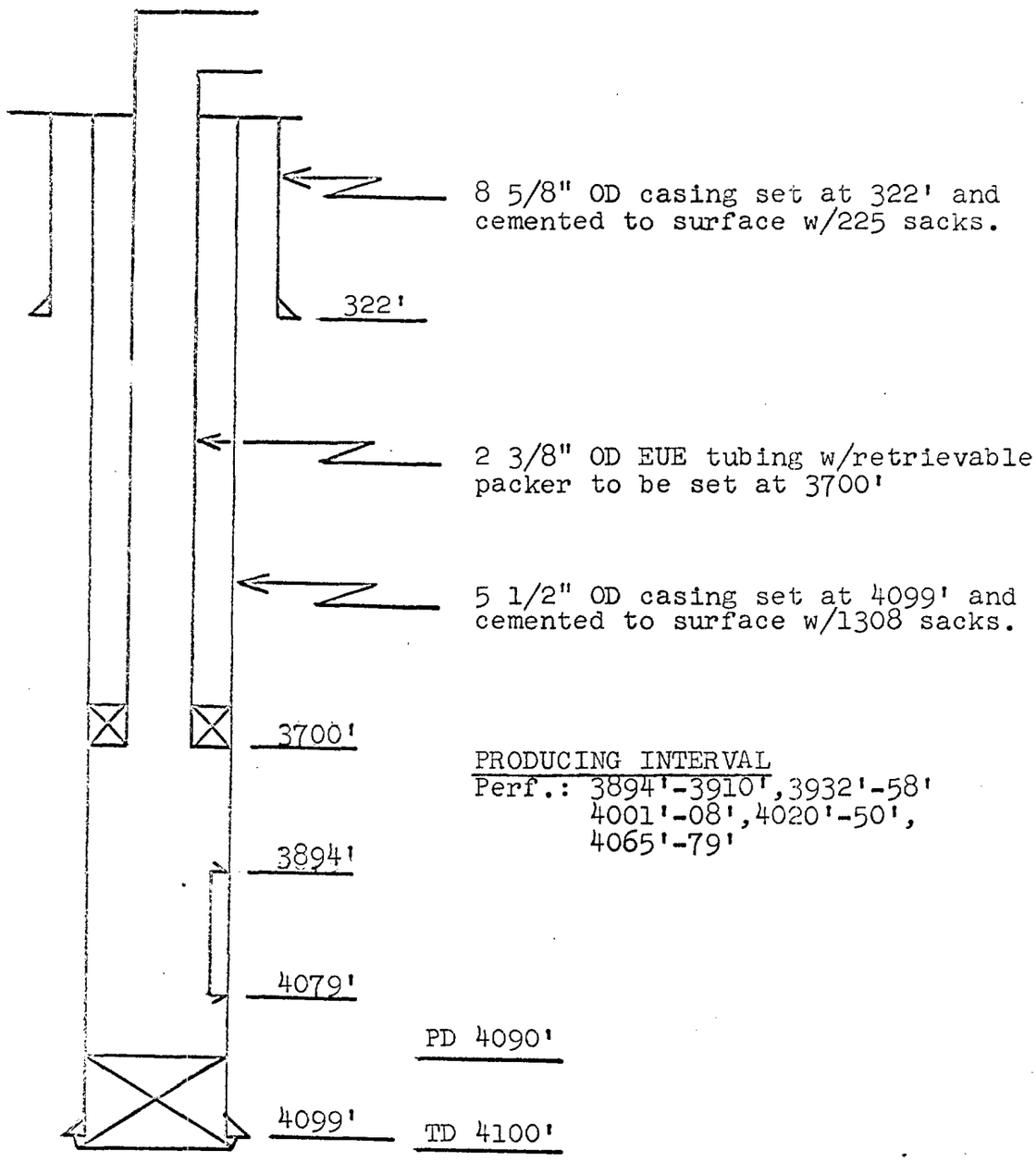
PROPOSED PROCEDURE

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.

EXHIBIT 4-10

WATER INJECTION WELL DATA

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



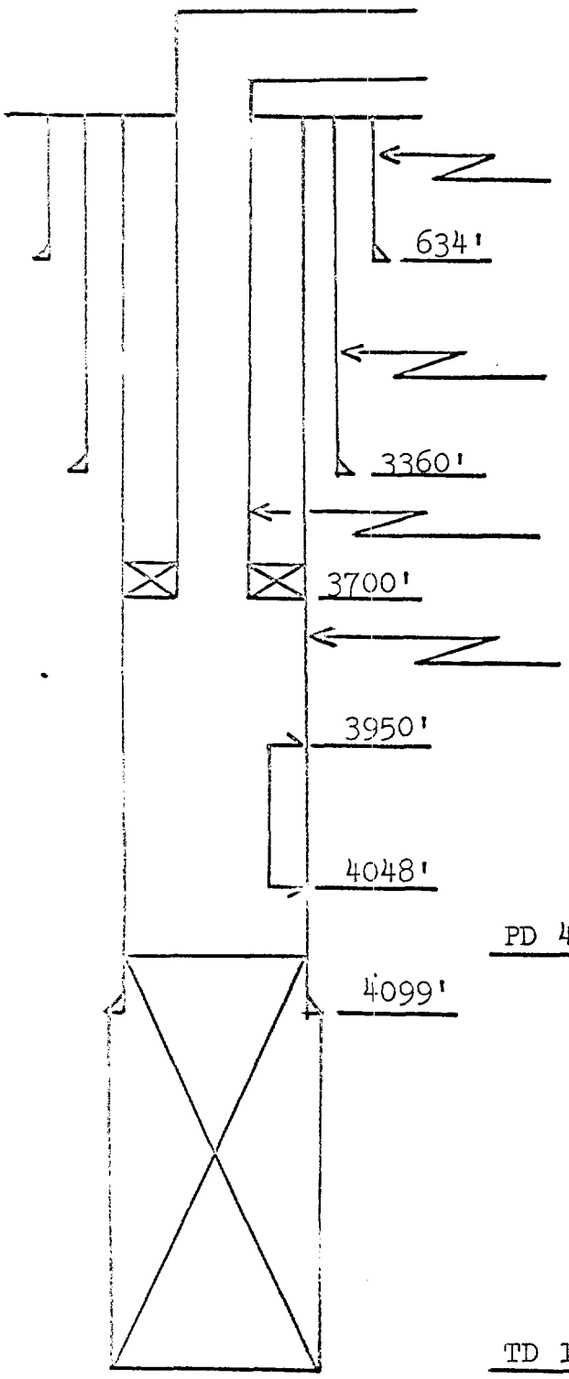
PROPOSED PROCEDURE

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.

EXHIBIT 4-11

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'



13 3/8" OD casing set at 634' and cemented to surface w/650 sacks.

9 5/8" OD casing set at 3360' and cemented to surface w/1864 sacks

2 3/8" OD EUE tubing w/retrievable packer to be set at 3700'.

7" OD casing set at 4099' and cemented to 2200' (temp. survey) with 125 sacks.

PRODUCING INTERVAL
Perf.: 3950'-65',3981'-4007'
4016'-27', 4038'-48'

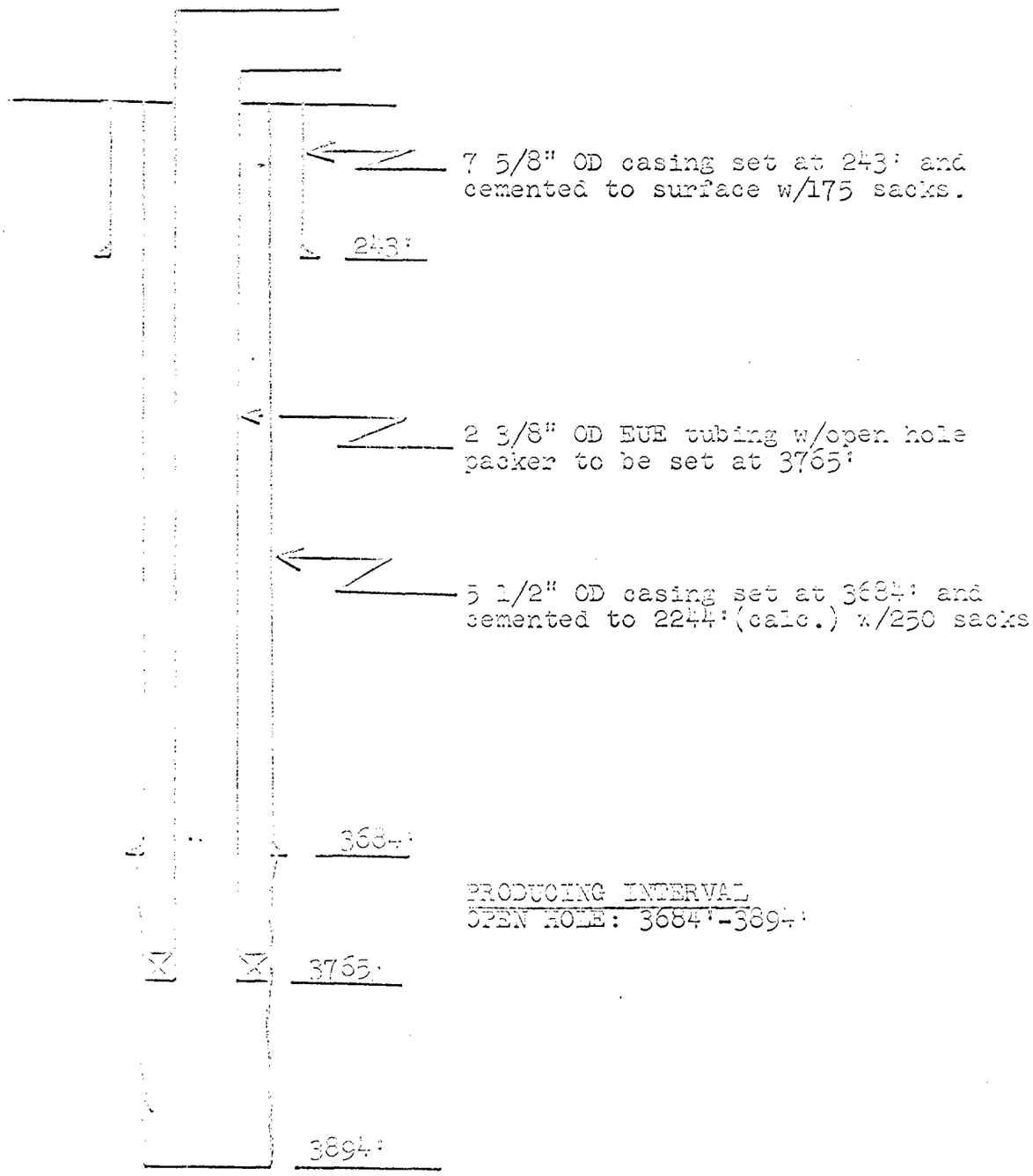
PROPOSED PROCEDURE

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.

EXHIBIT 4-12

WATER INJECTION WELL DATA

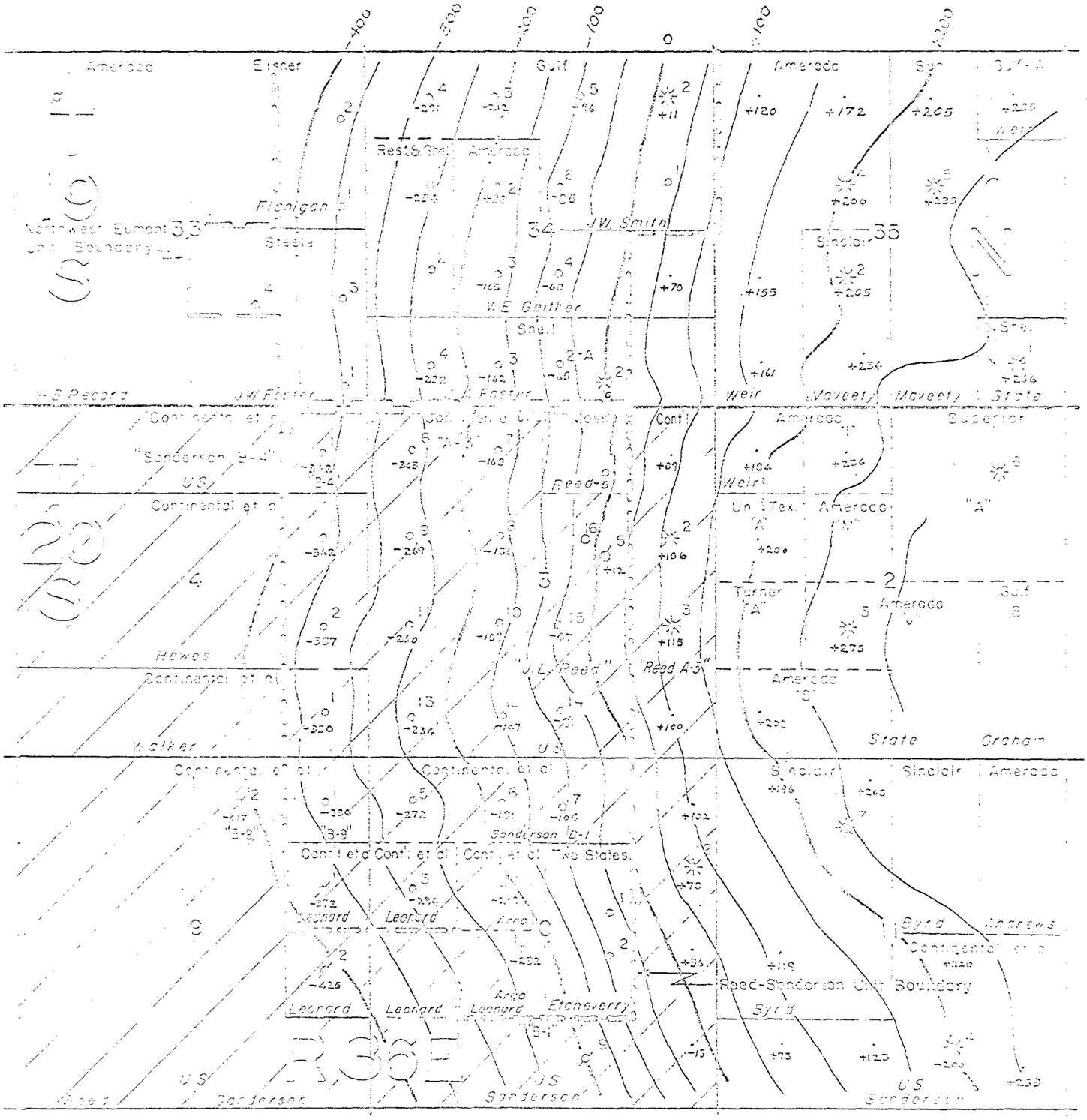
Two States
Etcheverry No. 1
2310' FNL & 1650' FEL Sec. 10-20-36
Elev.: BHF - 3590'
DF - 3600'



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.

EXHIBIT 4-13



CONTINENTAL OIL COMPANY

PRODUCTION DEPARTMENT

HOBBS DISTRICT

EUMONT YATES, SEVEN RIVERS, QUEEN OIL POOL

Lea County, New Mexico

REED-SANDERSON UNIT

LOWER QUEEN-PENROSE STRUCTURE MAP

Contour Interval: 50'

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

EXHIBIT NO. 5

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

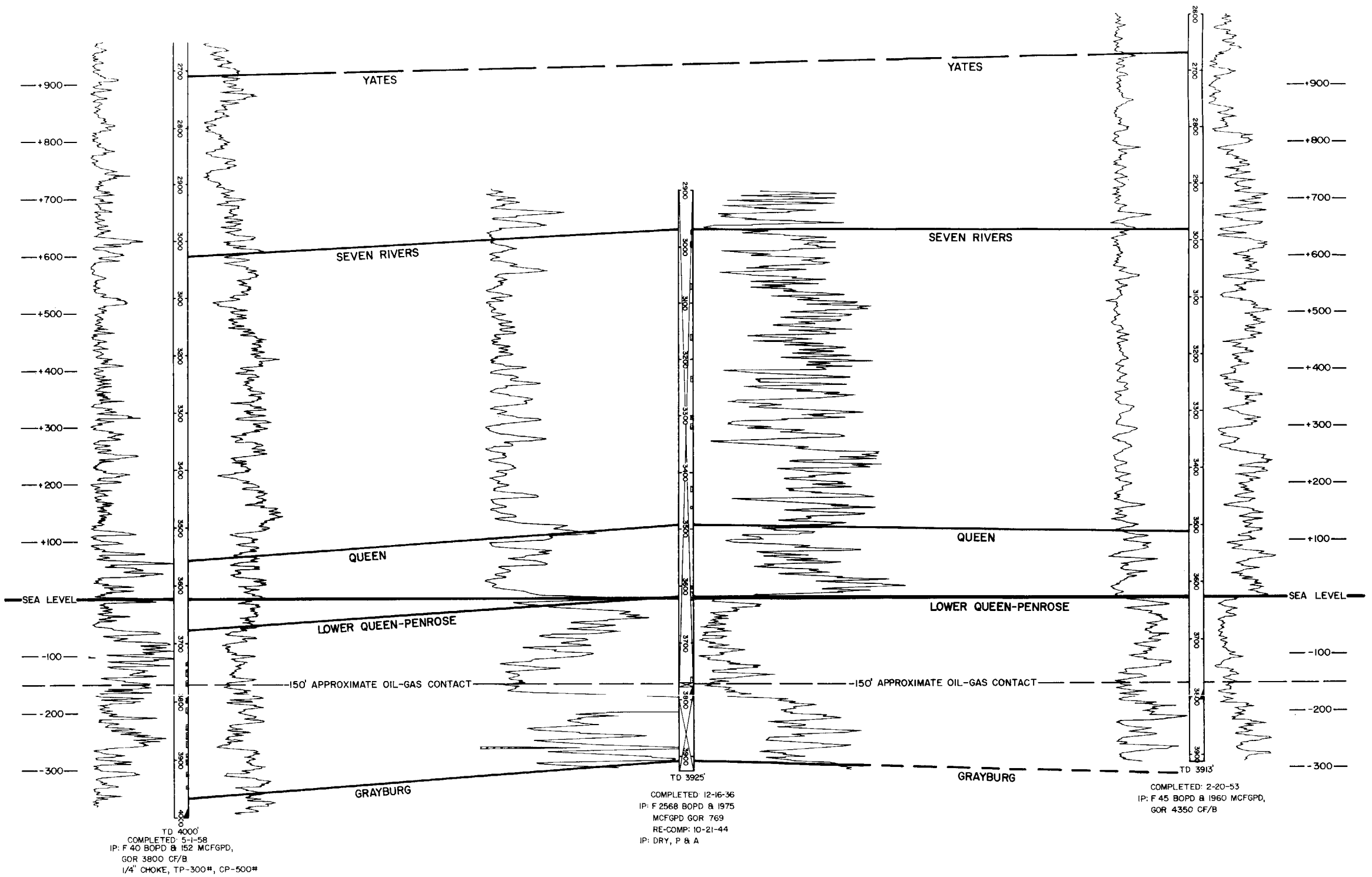
1.	Estimated Ultimate Primary Recovery, Bbls.	1,627,403
2.	Estimated Remaining Primary, 1-1-67, Bbls.	120,000
3.	Primary Recovery, Percent of ST Oil in Place 1-1-67	17.1
4.	Estimated Waterflood Volumetric Sweep Efficiency	0.55
5.	Estimated Waterflood Recovery	
	Barrels ST Oil	1,090,000
	Barrels ST Oil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

EXHIBIT 6

CONTINENTAL OIL COMP...Y
REED A-3 NO. 15
1980' FSL & 2310' FEL, Sec. 3, T20S-R36E
Elev. 3622' DF

CONTINENTAL OIL COMPANY
REED A-3 NO. 5
2310' FNL & 1650' FEL, Sec. 3, T20S-R36E
Elev. 3622' DF

H. S. MOSS
J. L. REED NO. 1
1003' FNL & 1653' FEL, Sec. 3, T20S-R36E
Elev. 3625 DF



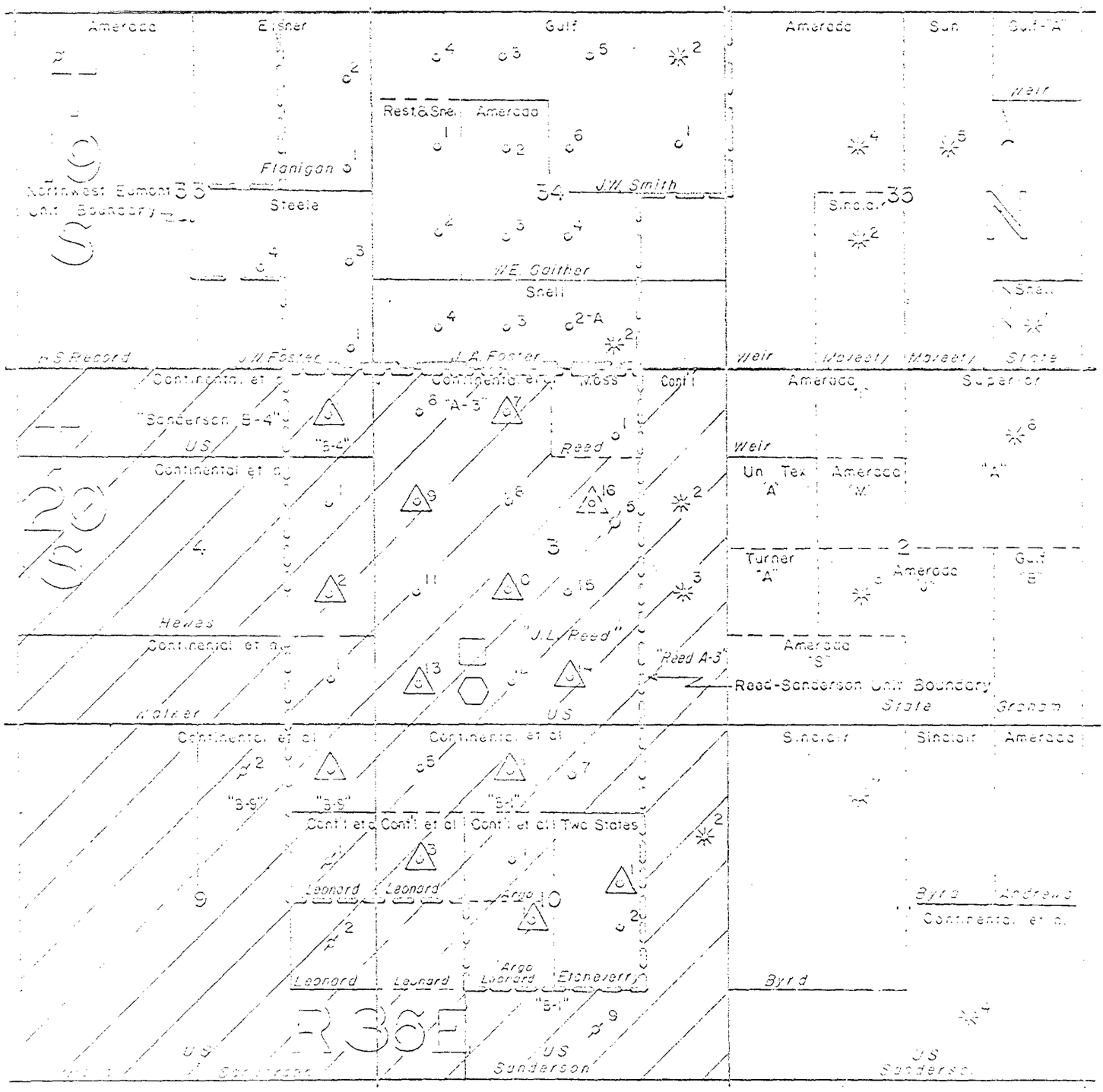
COMPLETED: 5-1-58
IP: F 40 BOPD & 152 MCFGPD,
GOR 3800 CF/B
1/4" CHOKE, TP-300#, CP-500#

COMPLETED: 12-16-36
IP: F 2568 BOPD & 1975
MCFGPD GOR 769
RE-COMP: 10-21-44
IP: DRY, P & A

COMPLETED: 2-20-53
IP: F 45 BOPD & 1960 MCFGPD,
GOR 4350 CF/B

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT—HOBBS DISTRICT
CROSS SECTION
EUMONT YATES SEVEN RIVERS QUEEN POOL
REED-SANDERSON UNIT AREA
SCALE
VERTICAL: 1" = 100'
HORIZONTAL: NONE
J. BOYLAN 8-10-66 BLJ

EXHIBIT NO. 7



-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

HOBBS DISTRICT

EUMONT YATES, SEVEN RIVERS, QUEEN OIL POOL

Lea County, New Mexico

REED-SANDERSON UNIT

SCALE

EXHIBIT NO. 3

F-2064-B
REV. 4-1-64

CONTINENTAL OIL COMPANY
PRODUCTION RESEARCH DIVISION

WATER ANALYSIS REPORT

Company Continental Oil Company — Date March 1, 1966 — No. W-662

Well E-M-E SWD-1 No. 1 — Location

Field E-M-E SWD System — Formation Mixture

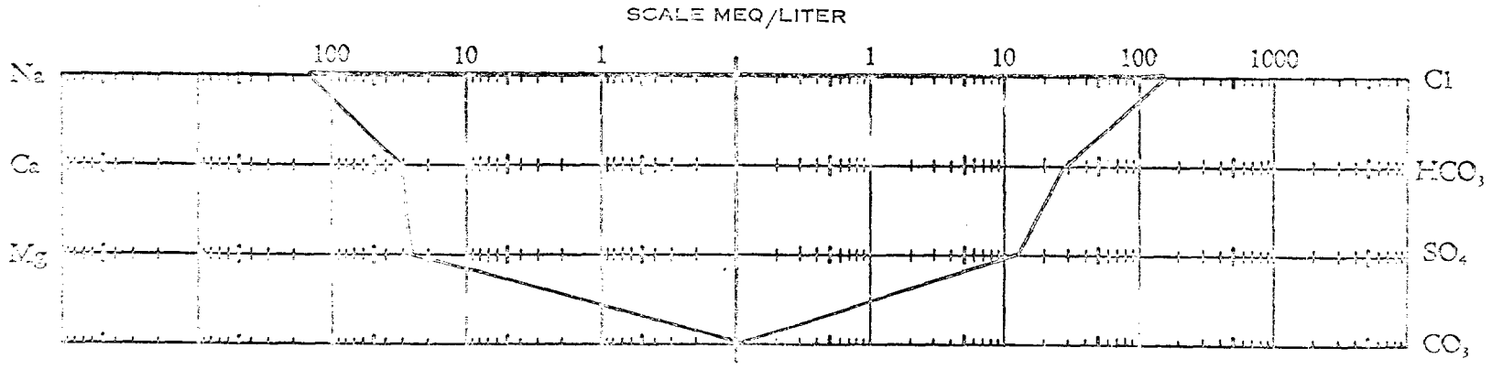
State New Mexico — County Lea — Depth

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		12,800	Sodium (Na)	153.54	3,330
Hydrogen Sulfide		330			
Chlorides (Cl)	166.11	5,890	Magnesium (Mg)	25.41	305
Sulfates (SO_4)	13.75	660	Calcium (Ca)	30.40	608
Carbonates (CO_3)		0	Ba		0
Bicarbonates (HCO_3)	29.18	1,780	Iron (mg/L) Total	0	Dissolved 0
Free Hydroxyl (OH)			Suspended Solids		23

WATER ANALYSIS PATTERN
SCALE MEQ/LITER



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

B. M. Casad
Supervisor
Production Chemistry Group

Analysis Requested by: R. L. Freeborn

Copies to: MHD-RGP-LPT-JAQ-JLD-NGC-TMA

EXHIBIT NO. 9