Case No.

607

Application, Transcript,
Small Exhibits, Etc.

Lowry et al Operating Account

Factual Data Report

South Blanco Tocito Pool

Rio Arriba County, N. M.

Ex G
Case 607
Lowell

SOUTH BLANCO TOCITO POOL

Rio Arriba County, N. M.

Pool Information:

Sixteen wells had been completed in the South Blanco Tocito Pool as of December 1, 1953. Three of these wells are presently operated by the Johnston Oil and Gas Company, and the remaining thirteen wells are operated by Lowry et al Operating Account.

Of the thirteen wells completed by Lowry in the South Blanco Tocito Pool, eleven are currently oil productive, one well is a gas well and one well is being used as a water injection well. Cumulative oil and gas production from inception through November 30, 1953 for the Lowry et al Operating Account wells is as follows:

	Cumulative Production		
	Oil, Barrels		*Gas, MCF
T-85	2,489		4,284
T-109	40,623		72,562
T-157	123,794		150,729
T-123	0	(Gas well - S.I.)	0
T-125	5,976		6,430
T-127	36,143		32,673
T-129	54,814		51,234
T-132	90,436		108,101
T-134	6,213	(W.I.well-10/7/53)	19,239
T-177	35,319		127,753
T-179	216,767		307,461
T-182	76,747		235,339
T-207	91,791		174,926
	781,112		1,290,731

* Estimated

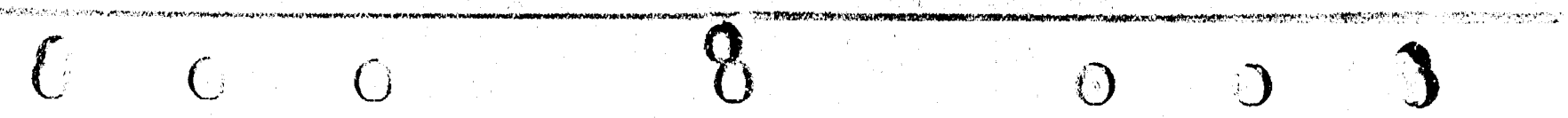
The completion of Lowry et al Operating Account T-123, located in the NW/4, NE/4, Section 7, Township 26 North, Range 6 West, as a gas well

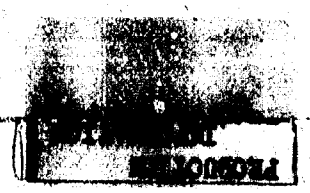
confirmed the existance of a gas-cap for the South Blanco Tocito Pool. Prior to the drilling of this well, the Pool was considered to be a depletion type reservoir. The gas-oil contact is estimated to be at approximately a subsea datum of -110 feet at the present time for the South Blanco Tocito Pool.

A pressure maintenance program by the injection of water was commenced for the Lowry et al Operating Account properties of the South Blanco Tocito Pool on October 7, 1953. Lowry's T-134 well, located in the NE/4 NW/4 Section 10, Township 26 North, Range 6 West, was converted from an oil producing well to a water injection well. Current injection rate into this well approximates 1500 barrels of water per day at a surface injection pressure of approximately 1900 p.s.i. Cumulative water injection from inception through December 11, 1953, is as follows:

	Water injected, barrels
October, 1953	14,511
November, 1953	41,607
12-1 thru 12-11-53	16,716
	72,834

There has been a substantial reduction in the producing gas-oil ratios for some of the wells offsetting the water injection well. These wells that have been affected are presently producing at approximate solution gas-oil ratios. It is too early in the life of the pressure maintenance program to evaluate results, and the program is being continued on an experimental basis.

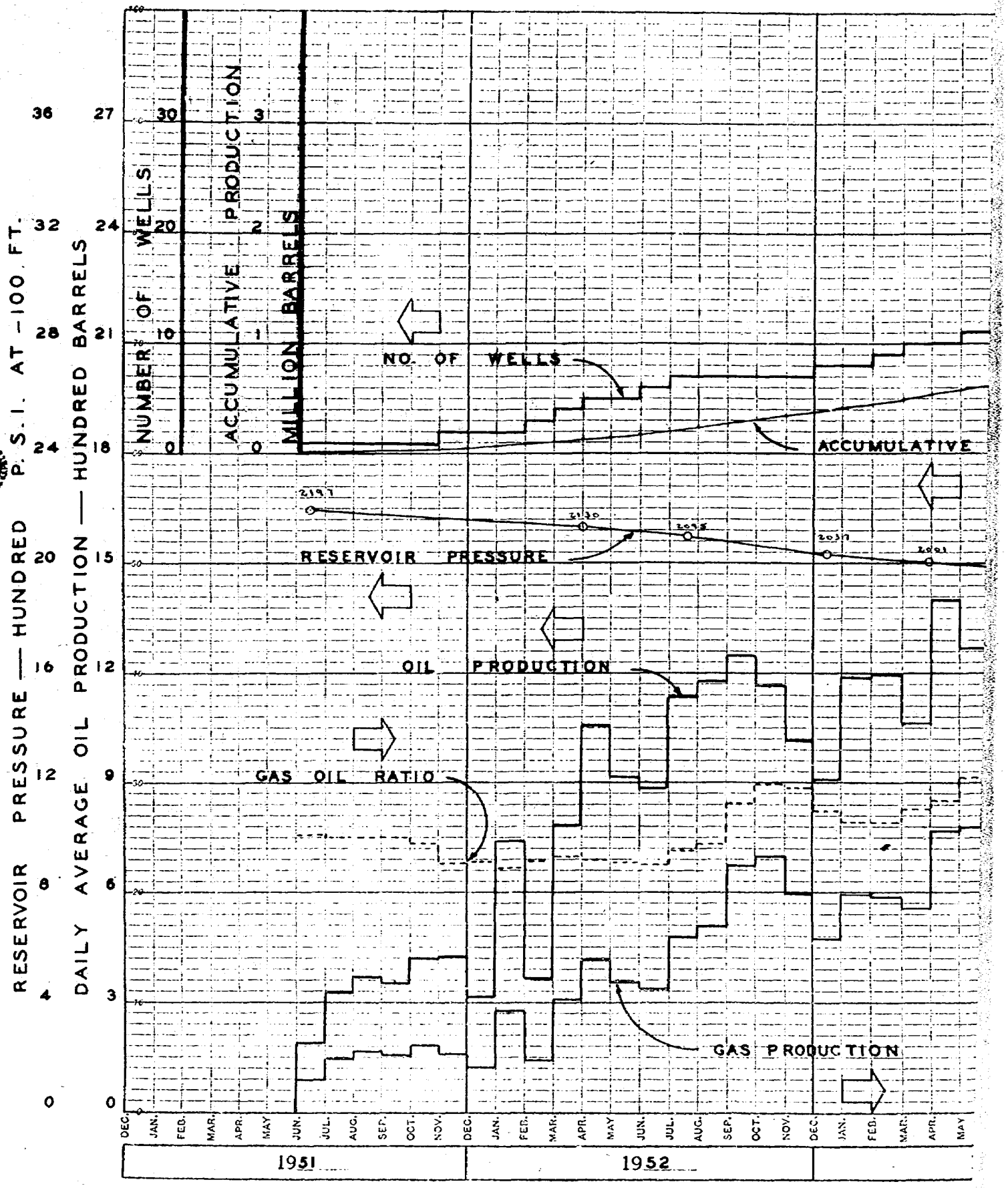


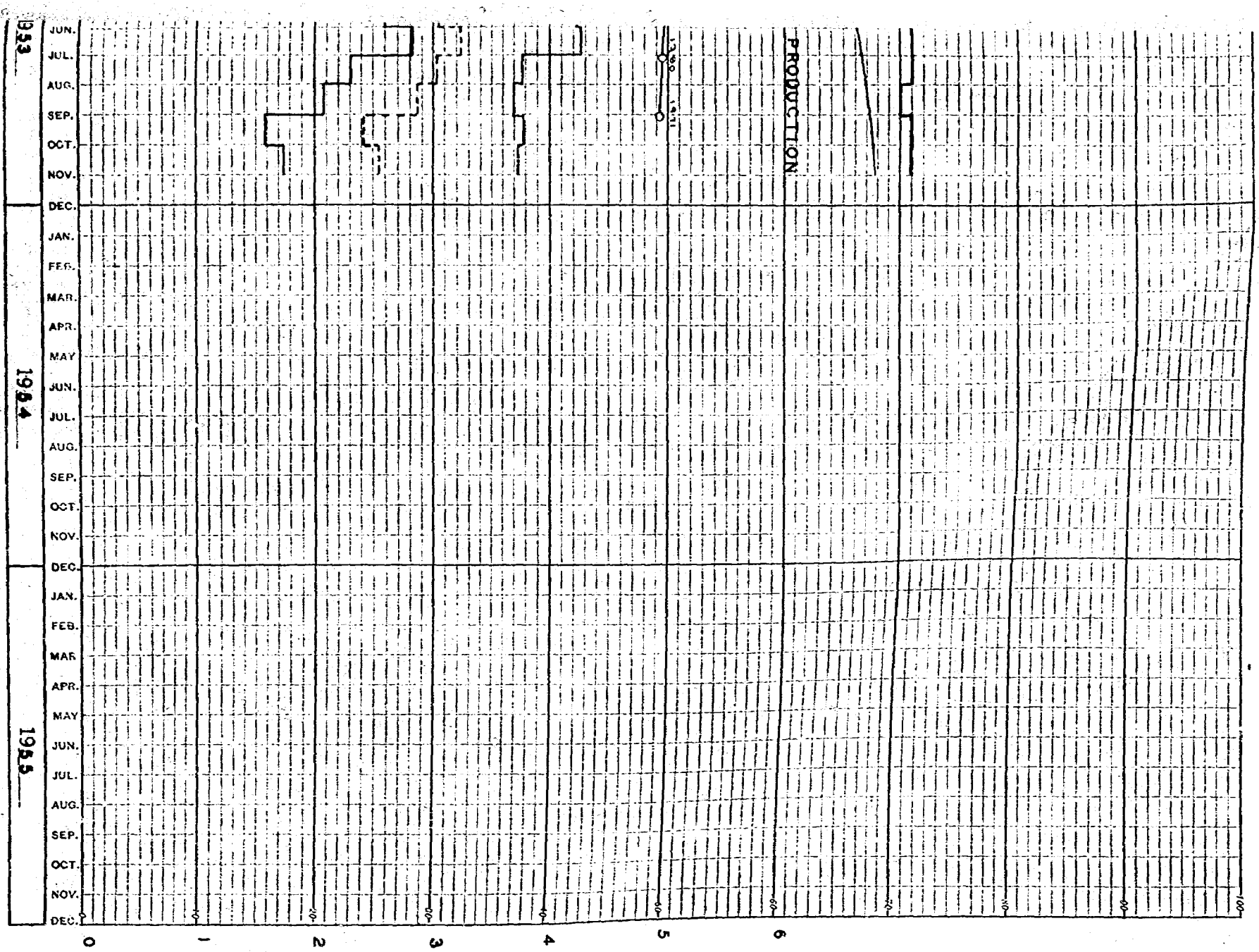


South Blanco Tocito Pool - Rio Arriba County, NM

Month & Year	Monthly Oil Production, Barrels	Monthly Gas Production, M.C.F.	Gas-Oil Ratio Cu.Ft./Bbl.	Daily Average Oil Production, Barrels	Daily Average Gas Production M.C.F.	Cumulative Oil Production Barrels	Cumulative GAs Production, MCF
1953							
May	43,318	79,376	1832	1397	2561	566,290	889,408
June	38,026	77,806	2046	1268	2594	604,316	967,214
July	39,490	87,591	2218	1274	2825	643,806	1,054,805
August	35,224	71,287	2024	1136	2300	679,030	1,126,092
September	33,285	62,733	1885	1110	2091	712,315	1,188,825
October	35,254	49,392	1401	1137	1593	747,569	1,238,217
November	33,543	52,514	1566	1181	1750	781,112	1,290,731

SOUTH BLANCO TOCITO POOL
RIO ARRIBA COUNTY N M




1953
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.
1954
JAN.
FEB.
MAR.
APR.
MAY
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.
1955
PRODUCTION
1350
1911
0
20
40
60
80
100
0
2
3
4
5
6
DAILY AVERAGE GAS PRODUCTION — THOUSAND M. C. F.
0
2
3
4
5
PRODUCING GAS OIL RATIO — THOUSAND CU. FT. PER BARREL

BOTTOMHOLE PRESSURE TESTS

Datum -100 ft.

South Blanco Tocito Pool

Rio Arriba County, N. M.

Lowry et al Operating Account

Well No.	Date	Hours Shut In	Bottomhole Pressure
T-134	8-3-53	116	1782 p.s.i.
T-179	8-3-53	95	1969 p.s.i.
	10-19-53	116	1963 p.s.i.
T-132	8-3-53	90	1928 p.s.i.
	10-5-53	137	1912 p.s.i.
T-157	8-4-53	82	1885 p.s.i.
	10-5-53	144	1883 p.s.i.
T-109	8-3-53	103	1826 p.s.i.
	10-5-53	152	1828 p.s.i.
T-182	8-3-53	89	1934 p.s.i.
	10-7-53	48 days	1922 p.s.i.
T-207	8-3-53	77	1903 p.s.i.
	10-7-53	171	1906 p.s.i.
T-129	8-4-53	111	2020 p.s.i.
	10-7-53	168	1989 p.s.i.
T-177	8-3-53	81	2041 p.s.i.
	10-7-53	199	2004 p.s.i.
T-127	8-4-53	112	2091 p.s.i.
	10-[illegible] 53	76	2070 p.s.i.
T-85	8-4-53	142	1885 p.s.i.
	10-7-53	219	1892 p.s.i.
T-125	10-19-53	240	2108 p.s.i.

Johnston Oil & Gas Company

Rincon 6	10-5-53	72	2114 p.s.i.

Weighted Average Reservoir Pressure

Datum -100 feet

	Date	Bottomhole Pressure, p.s.i.
Original reservoir pressure:	7-26-51	2197
1st General Survey:	5-1-52	2130
2nd General Survey:	8-18 - 8-20-52	2095
3rd General Survey:	1-12 - 1-14-53	2037
4th General Survey:	4-27 - 4-28-53	2001
5th General Survey:	8-3 - 8-4-53	1980
6th General Survey	10-6 - 10-7-53	1971

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OIL & GAS PRODUCTION DATA

South Blanco Tocito Pool

Date	Oil Production Barrels	Gas Production MCF - 15.025 p.s.i.a
5-1-52	130,008	176,439
8-20-52	234,402	311,446
1-14-53	400,133	600,774
4-28-53	518,909	802,889
8-4-53	643,806	1,054,805
10-7-53	716,094	1,194,311

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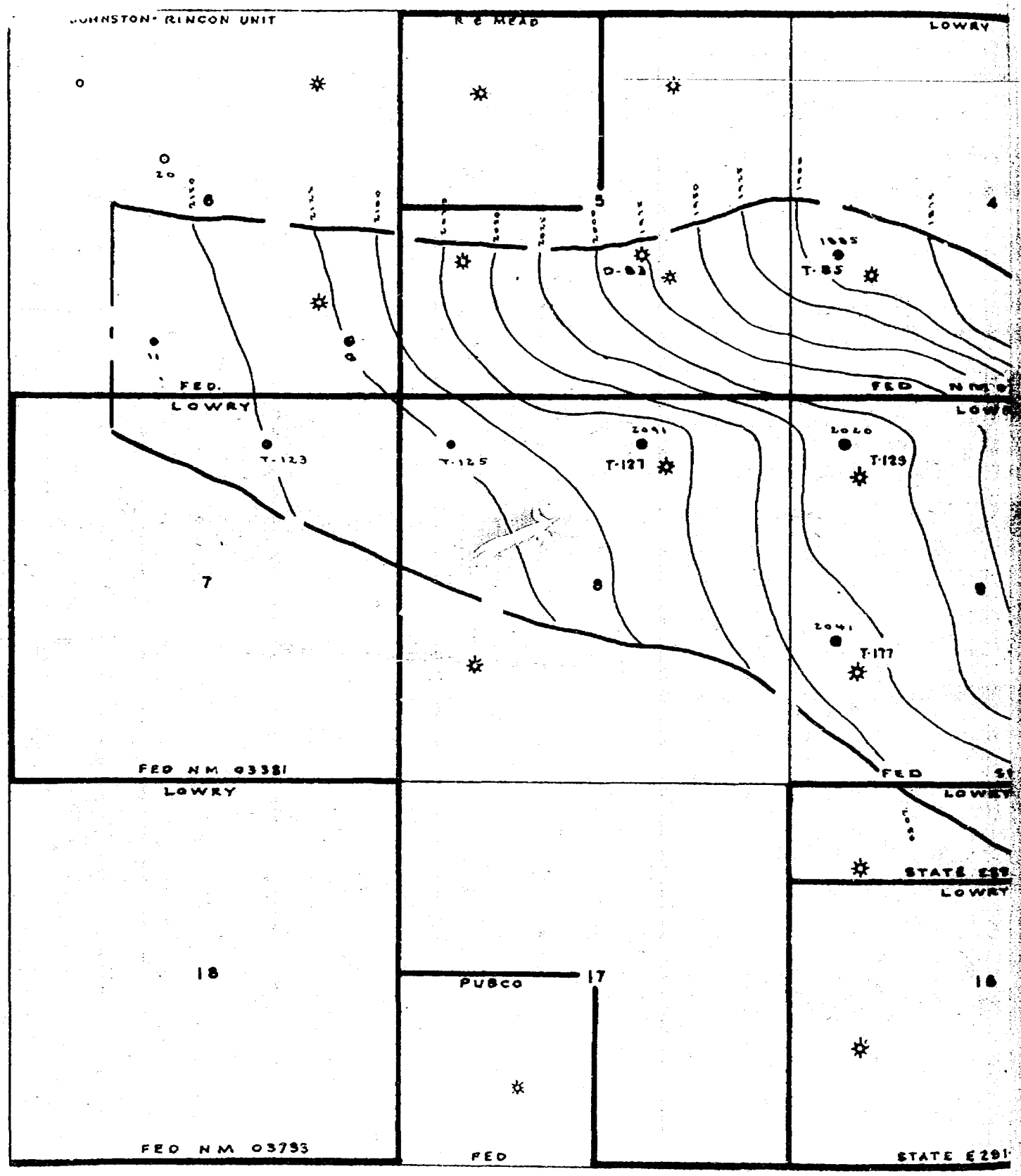

LOWRY OIL COMPANY

T26N - R6W

RIO ARRIBA COUNTY, N. M.

SOUTH BLANCO T

RIO ARRIBA CO

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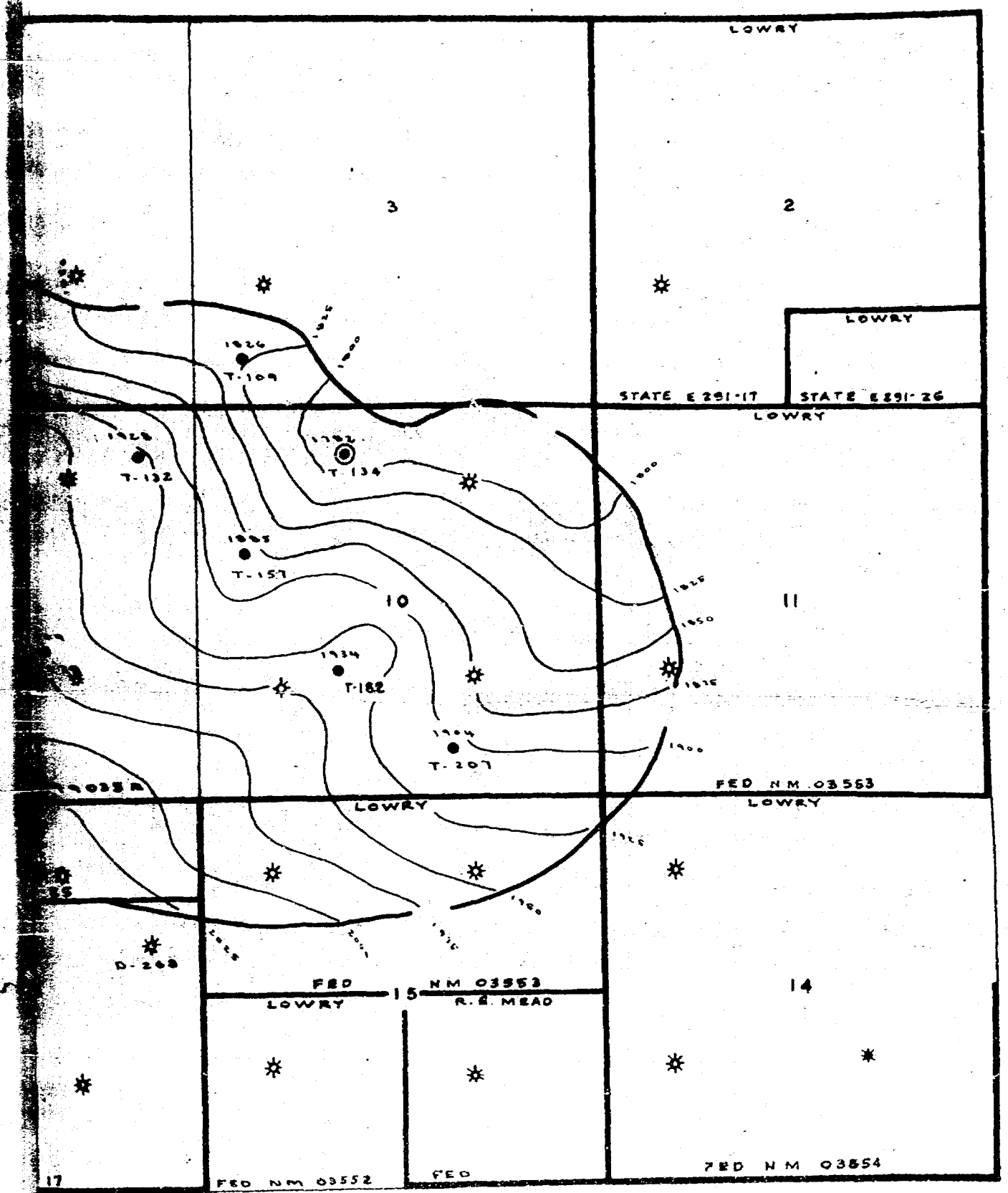

OCITO POOL
NTY, N. M.
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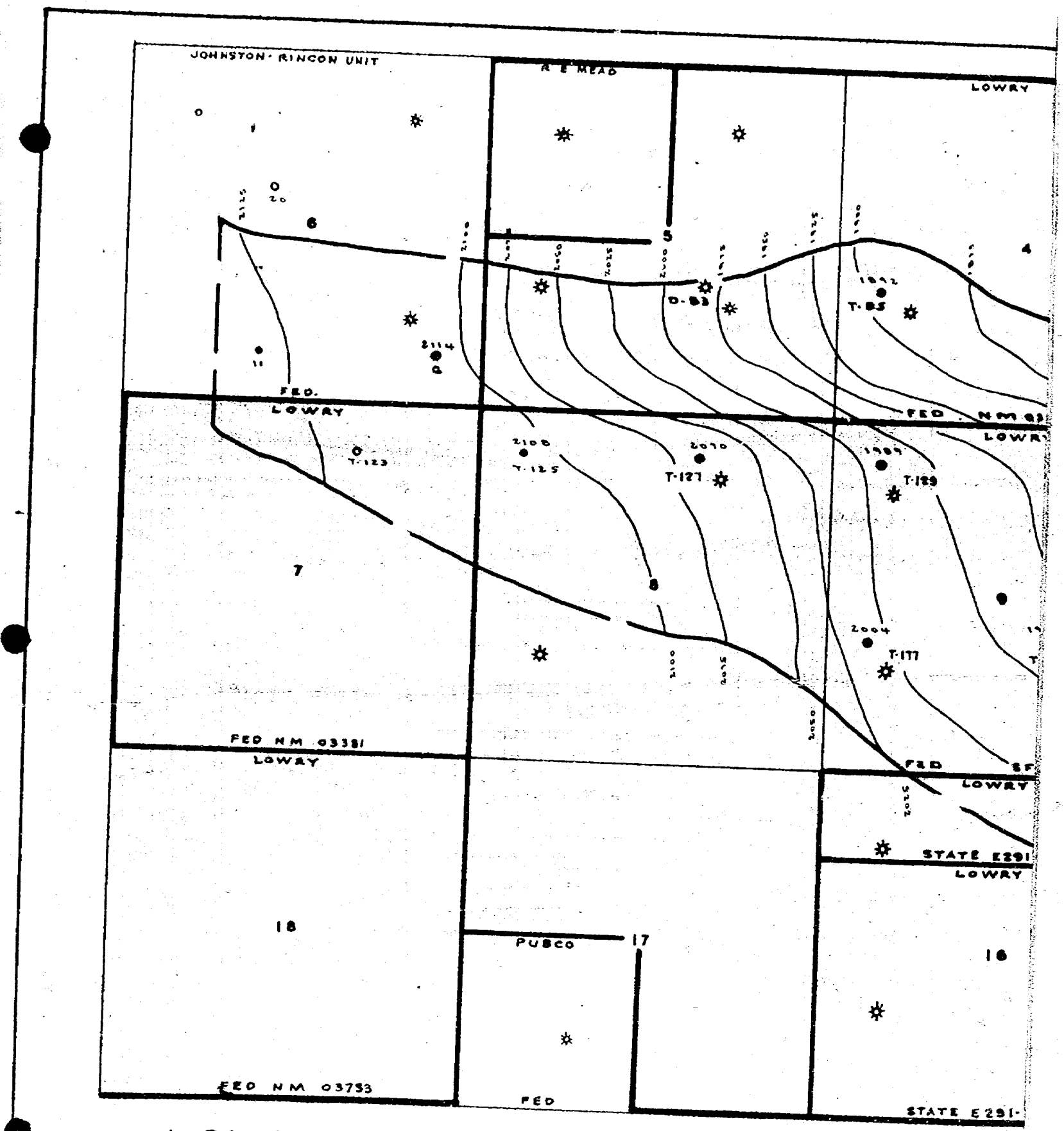
5 TH GENERAL SURVEY
AUGUST 3–4 1953

AVG RESERVOIR PRESS.
1980 PSI -100 FT ◎ W.I. WELLS



LOWRY OIL COMPANY

T26N - R6W

RIO ARRIBA COUNTY, N. M.

SOUTH BLANCO T(

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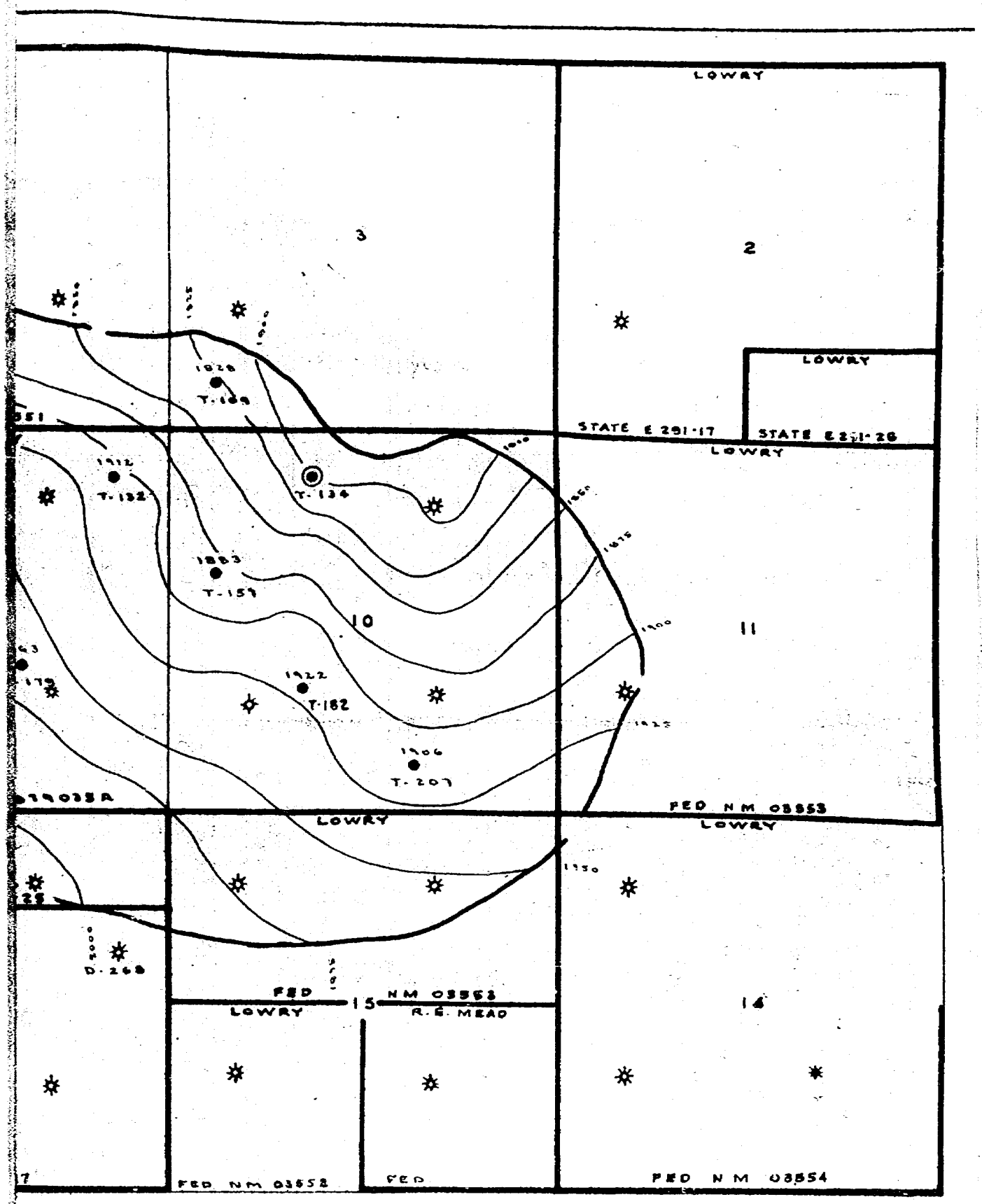

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NTY, N. M.
P

6 TH GENERAL SURVEY
OCTOBER 5-7 1953

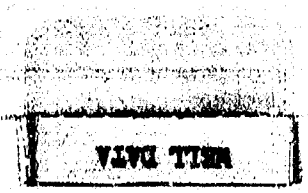
AVG RESERVOIR PRESS.
1971 PSI -100 FT

Gas-Oil Ratio Tests

Well No.	Date	Gas-Oil Ratio	Accumulative Oil Production
T-134	6-26-53	4036:1	5033
	7-13-53	3412:1	6012
	7-26-53	4879:1	6151
T-179	6-14-53	1128:1	190,733
	6-24-53	1227:1	192,232
	7-8-53	1271:1	194,460
	8-8-53	1133:1	199,026
	10-1-53*	1415:1	210,370
	10-29-53	1898:1	211,863
	11 - 53*	1304:1	214,670
T-132	6-13-53	1752:1	73,383
	6-24-53	1626:1	74,484
	7-13-53	1573:1	76,373
	7-29-53	1622:1	77,973
	8-11-53	1548:1	78,934
	10-28-53	1653:1	85,868
	11 - 53*	1375:1	88,353
	12-4-53	1306:1	91,340
T-157	6-10-53	1976:1	96,581
	6-27-53	1540:1	99,176
	7-15-53	1644:1	102,293
	7-28-53	1503:1	104,295
	7-31-53	1768:1	104,806
	8-11-53	1339:1	106,150
	10-31-53	1441:1	119,822
	11-27-53	886:1	123,269
	12-4-53	739:1	124,358
T-109	6-9-53	1494:1	28,882
	6-26-53	1601:1	30,148
	7-14-53	1830:1	31,490
	7-27-53	2608:1	32,453
	8-12-53	2280:1	33,197
	10-28-53	1370:1	38,253
	11-28-53	1379:1	40,550
	12-4-53	682:1	41 ,016
T-182	6-12-53	4826:1	68,513
	6-25-53	5142:1	69,810
	7-5-53	5326:1	70,874
	7-21-53	5615:1	72,463
	8-15-53	5405:1	74,575
	11-30-53	3661:1	76,747

Well No.	Date	Gas-Oil Ratio	Accumulative Oil Production
T-207	6-25-53	2015:1	67,756
	7-6-53	2027:1	69,427
	7-21-53	2399:1	71,962
	8-13-53	2898:1	75,158
	8-23-53	2613:1	77,199
	8-26-53	2288:1	77,710
	8-27-53	2112:1	77,880
	8-28-53	2271:1	78,050
	8-31-53	2108:1	78,366
	10- 53 *	2390:1	85,941
	10-30-53	2311:1	88,135
	12-1-53	2283:1	91,791
T-129	6-12-53	1138:1	27,654
	6-26-53	1231:1	29,857
	7-6-53	1173:1	31,098
	8-19-53	1129:1	38,110
	10-29-53	880:1	50,024
	12-1-53	681:1	54,923
	12-2-53	733:1	55,111
T-177	6-3-53	3287:1	13,888
	6-24-53	4186:1	17,499
	7-6-53	4483:1	19,306
	7-29-53	4577:1	23,125
	8-19-53	4128:1	26,009
	10-31-53	4313:1	33,466
	11-30-53	7252:1	35,319
T-127	5-4-53	818:1	1,721
	6-4-53	951:1	7,160
	6-26-53	883:1	10,845
	7-4-53	883:1	11,879
	8-20-53	988:1	22,225
	10-2-53	870:1	26,541
	12-4-53	789:1	36,552
T-85	6-30-53	1192:1	278
	7-1-53	1256:1	298
	7-29-53	2199:1	788
	8-17-53	2241:1	1068
	10-31-53	1563:1	1993
T-125	10-28-53	1076:1	968

* Monthly production values - measured.
Cumulative oil values include only 1/2 of subject months production.


WELL DATA

Location:	1980' FSL, 1980 FEL, Section 5, T26N, R6W
Elevation:	6,570' DF
Drilling Commenced:	June 15, 1953
Drilling Completed:	July 28, 1953
Commenced Producing:	Well was not commercially productive in the Tocito formation and was completed in the Dakota formation.
Surface Pipe:	10-3/4" OD casing set @ 478', with 175 sks cement.
Production Pipe:	7" OD casing set @ 7,446' with 200 sks cement.
Tubing:	2" EUE set @ 7,273'.
Total Depth:	7,452'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	Completed in the Dakota Formation. 1,670 MCF of gas per day.

Location:	1980 FSL, 660 FWL, Section 4, T26N, R6W
Elevation:	6,471' GL
Drilling Commenced:	May 6, 1953
Drilling Completed:	June 4, 1953
Commenced Producing:	June 21, 1953
Surface Pipe:	10-3/4" OD casing set @ 445', with 175 sks cement.
Production Pipe:	7" OD casing set @ 6,641' with 200 sks cement.
Tubing:	2" EUE set @ 6,640'
Total Depth:	6,691'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	23.05 barrels of oil per day

Location:	700' FNL, 1800' FEL, Section 7, T26N, R6W
Elevation:	6,680' GL
Drilling Commenced:	October 25, 1953
Drilling Completed:	November 24, 1953
Commenced Producing:	December 1, 1953

Surface Pipe: 10-3/4" OD casing set @ 470 feet with 175 sacks of cement.

Production Pipe: 7" OD casing set @ 6843 feet with 200 sacks of cement.

Casing Perforation:	6797 - 6812 feet with 90 shots.
Tubing:	2" E.U.E. set @ 6817 feet.
Total Depth:	6845 feet
Acid Treatment:	None
Shot Record:	Not shot.
Initial Potential:	Flowed 4,635 MCF gas per day through 20/64" choke. CP: 1000 p.s.i. TP: 750 p.s.i.

Location:	660 FNL, 660 FWL, Section 3, T26N, R6W
Elevation:	6,693' GL
Drilling Commenced:	September 4, 1953
Drilling Completed:	October 3, 1953
Commenced Producing:	October 9, 1953
Surface Pipe:	10-3/4" OD casing set @ 455', with 175 sks cement.
Production Pipe:	7" OD casing set @ 6,881' with 200 sks cement.
Tubing:	2" EUE set @ 6,859'.
Total Depth:	6,889'.
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	612 barrels of oil per day.
Casing Perforation:	**6831 - 6846 feet with 90 shots.**

CORING RECORD

CORING RECORD

South Blanco Tocito Pool

Rio Arriba County, N. M.

- -

T-85

Core No. 1: 6644.0 - 6691.5: Cored 47.5 feet. Recovered: 47.5 feet: 13.5 feet black shale; 16 feet tight Tocito sandstone; 18 feet black shale.

D-83

Core No. 1: 6737.0 - 6759.0: Cored 22 feet. Recovered: 21.2 feet: 3 feet black shale; 7 feet tight shaly sandstone; 1 foot porous sandstone; 8.5 feet tight shaly sand; 1.5 feet shale.

Core No. 2: 6759.0 - 6778.0: Cored 19 feet. Recovered 19 feet: 19' shale.

T-125

Core No. 1: 6818.0 - 6858.0: Cored 40 feet. Recovered 19.4 feet: 15.8 feet shale; 3.6 feet sandstone.

Core No. 2: 6858.0 - 6889.0: Cored 31 feet. Recovered: 30.2 feet: Black shale.

T-123

Core No. 1: 6795.0 - 6845.0: Cored 50 feet. Recovered: 21.5 feet: 2 feet shale; 14.5 feet sandstone; 5 feet shale.

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DST RECORD

RECORD OF DRILL STEM TESTS

South Blanco-Tocito Pool

Rio Arriba County, N. M.

D-83:

Drill Stem Test: 6728 - 6778'. Tool open 3-1/2 hours.
Weak blow air when tool opened. Died in 32 minutes.
After 1 hour, had weak blow air for remainder of test.
Recovered: 180' drilling mud. Very small show of oil.
Hydrostatic pressure: 3320 p.s.i. Flowing pressure:
0-95 p.s.i. 30-minute shut in bottomhole pressure: 190 p.s.i.

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SOUTH BLANCO TOCITO POOL

PRORATION PLAN

WELLS NOT ASSOCIATED WITH SOUTH BLANCO TOCITO POOL PRESSURE MAINTENANCE PROJECT:

Prorated in accordance with Statewide Allowable Program and New Mexico Oil Conservation Commission Order No. R-326, with gas-oil ratio limitations.

AREA ASSOCIATED WITH SOUTH BLANCO TOCITO POOL PRESSURE MAINTENANCE PROJECT:

The allowable for this area to be determined on the following basis and the oil so allocated to be produced in accordance with good reservoir management, providing no well shall be allowed to produce in excess of 150 percent of the top unit allowable:

Marginal Units:

Ability of well to produce.

Non-Marginal Units:

Normal Unit Allowable x depth proportional factor of 2.77

High Gas-Oil Ratio Proration Units:

Normal Unit Allowable x depth proportional factor of 2.77

Proration Units having wells converted to water injection purposes:

Allowable determined by production records or New Mexico Oil Conservation Commission tests.

Proration Units having wells abandoned as a result of water encroachment:

Allowable determined by production records or New Mexico Oil Conservation Commission tests.

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ILLEGIBLE

SOUTH BLANCO TOCITO POOL

DATA CONCERNING NO GAS OIL RATIO LIMITATION FOR WELLS ASSOCIATED WITH SOUTH BLANCO TOCITO POOL PRESSURE MAINTENANCE PROJECT

NO GAS OIL RATIO LIMITATION

	Daily Allowable, Bbls.	Gas-Oil Ratio, Cu.Ft./Bbl.	Produced Gas, MCF
T-177	111	7252	805
T-182	111	3661	406
T-207	111	2283	253
	333		1,464 MCF

GAS OIL RATIO LIMITATIONS

	Daily Allowable, Bbls.	Gas-Oil Ratio, Cu.Ft./Bbl.	Produced Gas, MCF
T-177	31	7252	222
T-182	61	3661	222
T-207	97	2283	222
	189		666 MCF

ALLOWABLE DIFFERENCE FOR ABOVE TWO STATED CONDITIONS:

144 barrels per day oil production
798 M.C.F. gas per day

VOIDAGE SPACE OF PENALIZED ALLOWABLE:

Oil Voidage

144 bbls x 1.49618 = 216 barrels

Free Gas Voidage

$$\frac{798 \text{ MCF} - 144 \times .634 \text{ MCF}}{.726 \text{ MCF}} = 934 \text{ barrels}$$

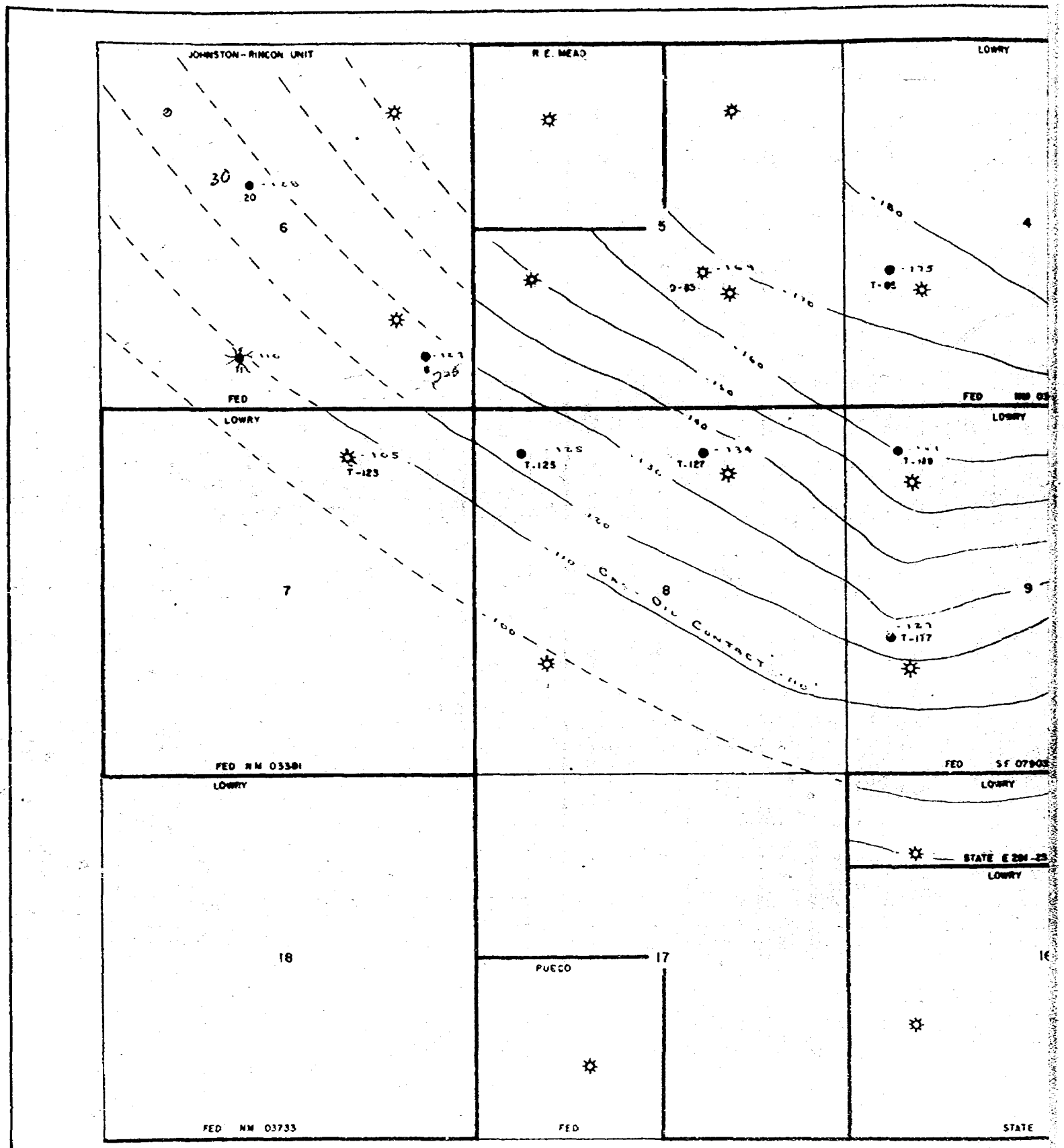
TOTAL GROSS VOIDAGE: 1150 barrels

PRESENT DAILY WATER INJECTION RATE: 1500 barrels

WATER INJECTED MINUS PENALIZED ALLOWABLE VOIDAGE:

1500 - 1150 = 350 barrels.

ILLEGIBLE



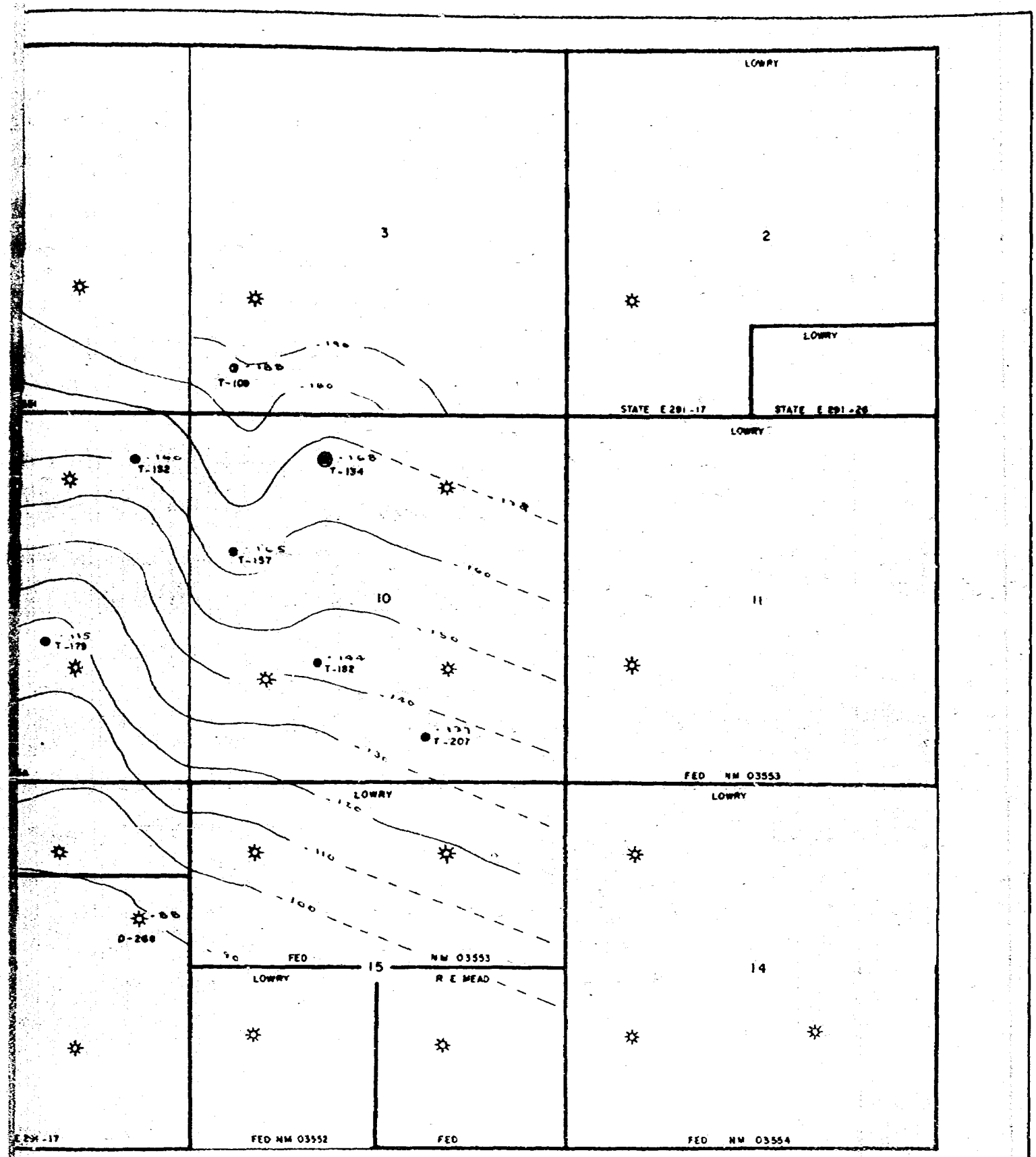
LOWRY OIL COMPANY

T.26N. - R.6W.

RIO ARRIBA COUNTY, N.M.

SOUTH BLANCO

RIO ARRIBA CO



TOCITO POOL

UNTY , N. M.

CONTOUR MAP

TOP TOCITO SANDSTONE

© W. I. WELLS

Specify Nekoosa BOND
MADE IN U.S.A.

Nancy –

Save This

Gr

THIS IS NEKOOSA BOND WHITE WOVE SUBSTANCE 20

5. OSWELL - FARMINGTON Oil Pool (SAN JUAN County)

No reports

T. 29 N. R. 11 W. NMPM.
N½ Sec 3; N½ SEC 4

T 30 N. R 11. W NMPM
S½ Sec 27; S½ Sec 28;
ALL SECS. 33 and 34.

6. (FETTIGREW (MESA BLANCA)) Tocito — Oil Pool - (Rio Arriba County)

Reports filed -

34,000 BBLS and

12 wells

Temporary -

T 26 N. R. 6 W NMPM
SW¼ Sec 3; SE¼ Sec 4; ALL Sec 9;
W½ Sec 10; NW¼ Sec 15; N½ Sec 16.

7 RATTLESNAKE - DAKOTA - ✓ Oil Pool (SAN JUAN County)

Reports filed

1200 BBLS

40 wells?

T 29 N. R 19 W NMPM
ALL SECS 1 and 2; E½ Sec 11;
ALL SECS, 12 & 13.
T. 30 N. R. 19 W NMPM
S½ Sec 35; SW4 Sec 36.

8 RATTLESNAKE - PENNSYLVANIAN — Oil Pool —

Reports filed

T 29 N. R. 19 W NMPM
ALL SECS 1 & 2; E½ Sec 11;
ALL SECS 12 & 13.

T. 30 N. R. 19 W. NMPM
S½ Sec 35; SW4 Sec 36.

8A.

R-15 The following Oil Pools are named and described under Rule 5 - in Appendix A of Order 850 — Jan 1, 1950

1 Bloomfield-Farmington Oil Pool (San Juan County)

No reports

T-29 N-R-11 W NMPM

W½ Sec 13; All Secs. 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23; W½ Sec 24.

2 Hogback-Dakota (Oil pool) San Juan County.

Reports filed
4,000 BBLS
9 wells

T. 29 N-R-16 W. NMPM

S½ Sec 18; All Sec 19.

3. Hospah Oil pool — (McKinley County)

Reports filed
12,600 mo.
45 wells

T 17 N. R. 8 W NMPM

W½ Sec 6; NW¼ Sec 7.

T 17 N-R. 9 W. NMPM

All Sec 1; E½ Sec 2; NE¼ Sec 11; N½ Sec 12.

T. 18 N. R. 8 W. NMPM.

W½ Sec 31.

T. 18 N. R. 9 W NMPM

E½ Sec 35; All Sec 36.

4. Lindreth - Dakota (Rio Arriba County)

Reports filed
1 well
170 MCF

T 24 N. R. 2 W. N.M.P.M.

All Secs. 20, 21, 28 & 29.

50,330 BBLS Monthly District 3 - Oil pools -

9. RED MOUNTAIN - MESAVERDE OIL POOL (McKinley County)

Reports filed =
3 wells
900 + BBLS

T. 20 N. R. 9 W. NMPM
ALL SECS. 20, 21, 28 + 29.

10. STONEY BUTTE - DAKOTA. OIL POOL - SAN JUAN County.

No reports =

T. 21 N. R. 13 W NMPM
W½ Sec 6; W½ Sec 7

T. 21. N. R 14 W, NMPM
E½ Sec 1; E½ Sec 12.

T. 22 N. R, 13 W. NMPM
W½ Sec 31.

T. 22 N. R. 14 W. NMPM.
E½ Sec 36.

11. TABLE MESA - DAKOTA - OIL POOL. (SAN JUAN COUNTY)

reports filed
7 wells
1500 BBLS

T 27 N. R 14 W. NMPM.
ALL SEC. 3.

(Look in deep Zone - Mississippian

12. WYPER - FARMINGTON - OIL POOL. SAN JUAN County

No reports

T. 30 N. R. 12 W. NMPM
ALL SECS 28, 29, 32 and 33.

13. ——— OIL POOL Magnolia Well - SANDOVAL Co.

T—— R—— NMPM

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE - NEW MEXICO

STATE OF NEW MEXICO TO:

All operators and parties interested in the oil pools located in San Juan, Rio Arriba, McKinley and Sandoval Counties: NOTICE AND ORDER TO SHOW CAUSE.

CASE 607:

You and each of you are hereby given notice and are hereby ordered to prepare to show cause before the Oil Conservation Commission of New Mexico at Santa Fe, New Mexico, on December 17, 1953, at 9 o'clock a.m. in Mabry Hall, State Capitol, why the following named pools in San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico, should not be classified or re-classified; extended or reduced; created or eliminated; designated or re-designated as to nomenclature and productive formations, respectively; and

Why the oil production, if any, should not be prorated and allocations fixed for the several pools under the provisions of Rule 505 of the statewide Rules and Regulations of the State of New Mexico, as follows:

Bloomfield-Farmington; Hogback-Dakota; Hospah; Lindrith-Dakota; Oswell-Farmington; South Blanco-Tocito; Rattlesnake-Dakota; Rattlesnake-Pennsylvanian; Red Mountain-Mancos; Stoney Butte-Dakota; Table Mesa-Dakota; Table Mesa-Mississippian; Wyper-Farmington; and pool designations for wildcat areas where substantial oil production has been encountered in any of the counties named hereinabove.

DONE at Santa Fe, New Mexico, this 27th day of November, 1953, upon motion of the Commission.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

R. R. Spurrier,
Secretary

S E A L

Memo: To George

At present time we are allocating oil in pools of Southeast N.M based on the factors of Rule 505. The various pools of San Juan, Rio Arriba, Mckinley + rural Sandoval are not prorated.

What steps do we have to take to prorate oil in accordance with Rule 505 in all pools of state.

to Bill:

We should advertise, hold hearing, in the nature of a show cause order then consider the factors affecting each pool and if no reason is advanced, put them under 505, ~~with~~ by order, which probably could be modified to meet "small wells & settled production" conditions to prevent premature abandonment

Notice for Publication -

CASE NO ——

State of New Mexico
Oil Conservation Commission:
To:

ALL OPERATORS AND PARTIES INTERESTED IN THE OIL POOLS LOCATED IN SAN JUAN, RIO ARRIBA, MCKINLEY AND SANDOVAL COUNTIES

Notice, AND ORDER To Show Cause

YOU AND EACH OF YOU ARE HEREBY given NOTICE, AND ARE HEREBY ORDERED to Show CAUSE, BEFORE THE Oil Conservation Commission OF NEW MEXICO, AT SANTA FE, NEW MEXICO, ON DECEMBER(?) 17 1953, at 9:oclock A M IN MABRY HALL, Capitol Office Building, Why THE FOLLOWING NAMED POOLS IN SAN JUAN, RIO ARRIBA, MCKINLEY & SANDOVAL COUNTIES, NEW MEXICO Should Not be CLASSIFIED OR RECLASSIFIED; EXTENDED, OR REDUCED; CREATED OR ELIMINATED; DESIGNATED OR REDESIGNATED AS TO NOMENCLATURE, AND PRODUCTIVE FORMATIONS, RESPECTIVELY, AND, THE OIL PRODUCTION, IF ANY, be PRORATED AND ALLOCATIONS FIXED FOR THE SEVERAL POOLS UNDER THE PROVISIONS OF Rule 505 OF THE STATE WIDE RULES AND REGULATIONS OF THE Oil Conservation Commission of New Mexico:

BLOOMFIELD-FARMINGTON; HOGBACK-DAKOTA; HOSPAH; LINDRETH-DAKOTA; OSWELL-FARMINGTON; SOUTH BLANCO-TOCITO; RATTLESNAKE-DAKOTA; RATTLESNAKE-PENNSYLVANIAN; RED MOUNTAIN-MESAVERDE; STONEY BUTTE-DAKOTA; TABLE MESA-DAKOTA; TABLE MESA-MISSISSIPPIAN; WYPER-FARMINGTON; AND POOL DESIGNATIONS FOR WILDCAT

AREAS WHERE SUBSTANTIAL OIL PRODUCTION HAS BEEN ENCOUNTERED in ANY OF THE COUNTIES NAMED HEREIN ABOVE.

DONE AT SANTA FE NEW MEXICO This ___ day of NOVEMBER 1953, Upon Motion of The Commission.

State of New Mexico
Oil Conservation Commission

RR S.
SECRETARY - DIRECTOR

SOUTH BLANCO TOCITO POOL

RESERVOIR VOIDAGE ANALYSIS

Lowry et al Operating Account Properties

Pressure:
971 @ -100 datum
1986 @ -150 datum approximate reservoir centroid

perature: 175° Fahrenheit

olume Factor: 1.49818 @ 1986 p.s.i.

as: 834.36 cu. ft. @ 1986 p.s.i.

ibility Factor: .8450 @ 1986 p.s.i.

s of gas at standard condition to occupy 1 barrel of space in reservoir

$$= \frac{1977}{15.025} \times \frac{520}{635} \times \frac{1}{.84} \times \frac{5.61}{1} = 726 \text{ cu. ft.}$$

Reservoir Voidage - November, 1953

Lowry operated properties

Average daily oil production:	1118 barrels per day
Average daily water injected:	1387 barrels per day
Producing gas-oil ratio:	1566 cu. ft. per barrel
Solution Gas Produced:	834 cu. ft. per barrel
Free Gas Produced:	732 cu. ft. per barrel

Reservoir space voidage by oil:
1118 barrels x 1.49818 = 1675 barrels

Reservoir space voidage by free gas:
1118 barrels x 732 cu. ft. = 1128 barrels

Total Gross Voidage:	2803 barrels
Daily average water injected:	1387 barrels
Net Voidage, Lowry :	1416 barrels

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
at
Santa Fe, New Mexico
December 17, 1953

In the Matter of:

Application of Commission on its own motion for order leading to allocation of oil and the classification of previously designated pools in San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico.

Case No. 607

(Notice of Publication read by Mr. Graham)

MR. TOWNSEND: I am Jim Townsend, with Stanolind. We have some evidence to present to the Commission, with reference to the Hogback-Dakota Field, if it is in order at this time.

ROBERT G. HILTZ

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. TOWNSEND:

Q Please state your name.

A Robert G. Hiltz.

Q By whom are you employed, Mr. Hiltz?

A Stanolind Oil and Gas Company.

Q In what capacity?

A I am a proration engineer in the Stanolind's north Texas, New Mexico division in Fort Worth, Texas.

Q You previously have been qualified to testify before this Commission?

A Yes, sir, I have.

MR. TOWNSEND: Are his qualifications acceptable to the Commission?

MR. SPURRIER: They are.

Q Mr. Hiltz, do you understand the present method of allocation of oil for the area covered under Case No. 607?

A Yes, it is my understanding at this time there is no actual formal proration of oil in the area effected; that the fields are permitted to produce essentially without restriction.

Q Do you understand the method of allocation proposed under this case for the effected area under the proposal that is made by the Commission?

A Yes, it is my understanding that the application of the state-wide allocation formula, the individual well allowables would be assigned.

Q Does Stanolind have any oil producing operations in the area effected?

A Yes, they have oil producing operations in the Hogback-Dakota Field in San Juan County.

Q Is that the only area where Stanolind has operations?

A That is the only field in that area in which Stanolind has oil production.

Q How many operators are there producing oil from the Hogback-Dakota Field?

A There is only one operator and that is Stanolind Oil and Gas Company.

Q How many royalties owners are involved under the present

producing operations?

A There is only one royalty interest involved, and that is the United States Government.

Q All Federal leases?

A That is correct.

Q Is there at this time any indication that there will be an extension of the field limits to include acreage owned by other operators?

A No, there is no indication that such extension will occur.

Q Then there is no question of correlative rights involved in the Hogback-Dakota Field?

A No, sir, with just one interest owner and one royalty, and with no further extensions of the field, there is no question of correlative rights in this field.

Q For the benefit of the Commission could you give a brief resume of the Hogback-Dakota Field?

A Well, very briefly, the Hogback Field is located in San Juan County, in Sections 18 and 19 of Township 29 North, Range 16 West. The discovery well in this field was drilled by the old Midwest Refining Company and was completed on September 25, 1922, flowing 375 barrels of oil per day from the Dakota Sand at 796 feet. Subsequent to that time, in the period from 1922 to 1925, 14 additional wells were drilled, of which 7 were producing wells. The majority of those wells were drilled by the Midwest Refining Company and all of the producing wells were owned and operated by Midwest. These properties were acquired by Stanolind in approximately 1930. Subsequent to that time only one additional well has been drilled and

that was early this year, inside the indicated field limits. That was drilled by Stanolind. At present there are eight producing wells. This field is obvious to us to be a very active water drive field, and all the wells are still flowing after 31 years of production. The field, however, is in the advance stage of depletion, being 75 to 80 percent depleted at this time. It comprises only approximately 200 producing acres as indicated to date. In view of the fact that at the time the development in this field took place there was no effective proration in the state the wells were drilled on a very irregular pattern. It was learned through development of the field that there were two faults cutting through the northern half of the field, and the operators in order to take maximum advantage of the structural position and to take into consideration the effect that faulting would have on production from the field, the resulting spacing and development pattern in the field is highly irregular.

Q What is the present average total production from the producing wells in the field today?

A The average production over the past three months has been approximately 215 barrels per day.

Q Is the field capable of producing at a rate in excess of that rate of production?

A Yes, being a very active water drive field it is capable of producing in excess of that rate.

Q Since there has been,up to this time, no restriction on production why has the field not been produced at a rate in excess of that?

A Well, based on our analysis of the performance history over the period of 31 years the present producing rate is indicated to be the optimum producing rate for the field. This being an active water drive field and that optimum producing rate we fell will prevent waste and assure our getting the maximum, ultimate recovery from the field.

Q What would the total allowable assigned to the field be if the state allocate - -

A For wells of that depth the present basic allowable is 40 barrels If it is assumed that each well were an assigned 40 barrels it would be 320 at this time.

Q That would be 100 barrels in excess of what experience has shown to be the optimum producing rate of the field?

A Yes, that is correct.

Q In your opinion will the present producing method from the Hogback-Dakota Field result in the maximum, ultimate recovery from that field?

A Yes, it will.

Q Based upon your testimony, then, have you a recommendation to make to the Commission, with reference to Hogback-Dakato Field?

A Yes, in light of the fact, as we have previously brought out, it is my recommendation that the Hogback-Dakota Field be allowed to continue producing as it has in the past, and that the statewide allocation formula not be applied to individual wells. In event, however, the Commission decides to apply the statewide allocation formula, it is my recommendation that the Hogback-Dakota Field be assigned its proportionate part of the oil allocated to the northwestern

part of the state, but that the total allocation to the Hogback-Dakota Field be on the field-wide basis without reference to the individual well allowables.

Q Do you have any further information to add?

A No, sir, I do not.

MR. TOWNSEND: That is all we have at this time.

MR. SPURRIER: Does anyone have a question of the witness? If not the witness may be excused.

(Witness excused)

MR. SPURRIER: We will take a five minute recess.

(Recess)

MR. SPURRIER: The meeting will come to order. Mr. Stanley has a correction to make in the oil allowable record.

MR. STANLEY: I made a statement that production was curtailed during a certain period in New Mexico, and also domestically, and that this curtailment was due to pipeline strike. I wish to correct that to read refinery strike.

MR. SPURRIER: We will continue with Case 607. I think we had better take them by pool. The next pool is Bloomfield-Farmington. Does anyone have any testimony to offer on that pool?

MR. MACY: I think we ought to let the record show that the Commission's records do not reflect any production from that pool.

MR. SPURRIER: Hospah; Lindrith-Dakota; Oswell-Farmington; South Blanco-Tocito - -

MR. KELLAHIN: Mr. Kellehin, representing Lowry Oil Company. We would like to present some testimony with the prorating of oil in the south Blanco-Tocito Pool. I want to call two witnesses. I

would like to call Mr. Anderson. Before we start the questioning I would like to make a brief statement in connection with this case. As the Commission will recall, considerable testimony has been presented to the Commission in the past in regard to the South Blanco-Tocito Pool. The Commission's records are rather complete as to production and the formation and the characterizations,and practially all the information that is available to the operator has heretofore been presented to the Commission in Cases No. 537 and 555. Rather than burden the record at this time with any repetition of that testimony we request that the Commission take notice of the records and exhibits that we previously introduced in those two cases. It is our desire this morning to supplement that information for the benefit of the Commission so that they will have a complete and up to date picture of the south Blanco-Tocito Pool. We are appearing also in compliance with the order that was entered by the Commission in Case 555, Order Number R-349, which provided that in the event of proration of oil production in the South Blanco-Tocito Pool, Rio Arriba County, New Mexico, the operator shall submit to the Commission a plan for operation, together with a plan which will, insofar as possible, take care of Blanco-Tocito division, which may arise as a result of the proration of production in the pool. As the Commission knows, this pool is now under a pressure maintenance program by water flooding, and it is our feeling that special consideration should be given to the South Blanco-Tocito Pool, because of the efforts of two operators in the efforts of conservation in connection with this water flooding program. I would like to call Mr. Anderson, please.

ROBERT ANDERSON

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. KELLAHIN:

Q State your name, please.

A Robert Anderson.

Q By whom are you employed, Mr. Anderson?

A Malco Refineries, Incorporated.

Q What is your position with Malco?

A President.

Q In your position as president of Malco Refineries, Mr. Anderson, are you familiar with the market requirements of the South Blanco-Tocito Pool?

A Yes.

Q Do you purchase all of the oil from that pool?

A Yes.

Q Would you state briefly to the Commission what your market demand is on the South Blanco-Tocito Pool?

A The market demand for the month of December from the South Blanco-Tocito Field is 1100 barrels per day, approximately 1100 barrels.

Q Do you anticipate any change in that in the future, Mr. Anderson?

A At the present time our market demand is limited by seasonal decline in gasoline purchases in northern New Mexico and we expect to have a marked increase in our demand the second quarter of 1954 when the tourist trade starts to move across the country again.

Q You consider the present market demand as a seasonal condition and not a permanent one?

A Yes.

Q Where do you find it desirable to purchase oil - - you have a refinery at Pruett?

A Yes.

Q Where do you find it more desirable to purchase your oil?

A Of course we prefer to purchase oil that is adjacent and connected to our pipeline and Hospah and South Blanco-Tocito.

Q Is that connected with your pipeline, that field?

A Yes.

Q And you find it more economical to purchase in that manner?

A Yes.

MR. KELLAHIN: I believe that is all.

MR. SPURRIER: Are there any questions of the witness? If not the witness may be excused.

MR. ANDERSON: If the Commission would like I would be glad to make a few general remarks on that.

MR. SPURRIER: Go right ahead.

MR. ANDERSON: We are the principal purchaser in the San Juan Field area and as a practical matter there are very few wells that would be effected by the application of state-wide proration order. The principle area that would be effected is the South Blanco-Tocito Field, which has the bulk of wells capable of producing any appreciable quantities of oil. The only exemptions are the well that Magnolia has completed in Entrada, and the second well they are now completing, which looks like it will be capable of producing considerable quantities, the well that Southern Union has completed ten miles east of the Tocito area. Those are the only properties that we feel would be effected at all. The other wells

are producing well under what would be any regulatory level and we look to those wells to take care of our seasonal increases or decreases in demand. During the last year we have taken as high as 200 barrels per well from the Tocito Wells, and at the present time are taking under 100, which is less than the state-wide order would permit. We personally have no objection at all to the application of the state-wide order with the one qualification that in the event market demand or development in the area becomes such that it is inconsistent with the state-wide order we would like to be able to reopen it. Whether that would be in the spring or if it ever occurs it is hard to say, but we certainly would like to ask the Commission to keep an open mind at a later date in the event we have to approach for a higher allowable than the state-wide order would permit.

Q Would curtailment of production below your market demand seriously effect your operations there?

A Yes, it would because we have no alternate source of supply whatsoever.

MR. KELLAHIN: That is all.

MR. SPURRIER: The witness is excused.

(Witness excused)

A. F. HOLLAND

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. KELLEHIN:

Q Will you state your name, please?

A My name is A. F. Holland.

Q By whom are you employed?

A I am employed by the Lowry Oil Company.

Q What is your position?

A I am petroleum engineer, with Lowry.

Q Have you testified before this Commission previously and qualified as an expert?

A Yes.

MR. KELLAHIN: Are his qualifications acceptable?

MR. SPURRIER: They are.

Q Mr. Holland, in connection with the proposed proration of oil in the northwest area, including the South Blanco-Tocito Pool, have you made a study of completions in the South Blanco-Tocito Pools?

A I have, for this and past hearings.

Q Have you prepared any Exhibits in connection with that study?

A Yes, we have data to supplement the data that has previously been furnished the Commission to bring the field performance records and the field characterizations information up to date.

Q Have you a plat showing the South Blanco-Tocito Pool, Mr. Holland?

A I have a plat we would like to introduce as an Exhibit, showing the present producing wells of the South Blanco-Tocito Pool - -

MR. KELLAHIN: Will you mark that as an Exhibit?

A (Continuing) - - and the present limits of the pool as defined by the New Mexico Conservation Commission.

(Lowry Oil Company's Exhibit A Marked for Identification)

Q Referring to what has been marked as Exhibit A, Mr. Holland, would you state what the broken line there set out on that Exhibit shows?

A That line indicates the present pool limits of the South Blanco-Tocito Pool as defined by the New Mexico Oil Conservation Commission.

Q What is the colored area on that Exhibit?

A The area colored in yellow represents the area operated by Lowry and Associates, operating agent.

Q The area in white, is that operated by other operators?

A That is correct.

Q Does that Exhibit show the location of Tocito Wells, and how are they designated?

A That plat shows all of the wells that have been drilled in the area. The Tocito wells are numbered, the other wells are not. All of the Tocito Wells are oil wells, with the exception of one well. So, those wells can be determined in that manner, can be identified.

Q Anything else you want to add to that, Mr. Holland?

A I have nothing further on it.

Q Have you prepared a structural contour map showing the top of the Tocito formation?

A I have a plat we would like to introduce as an Exhibit.

(Lowry Oil Company's Exhibit B, Case 407, Marked for Identification)

A Exhibit B is a contour map on the top of the Tocito Sandstone for the South Blanco-Tocito Pool. In addition to the contours the estimated gas-oil contact for the pool is indicated thereon.

Q How is it indicated, Mr. Holland?

A It coincides with the minus one hundred ten foot contour line, and is so labeled. The drilling of the Lowry T-123 Well in the northeast quarter of Section 7 confirmed the presence of a gas cap for the South Blanco-Tocito Pool. Based on information from that well the estimated gas-oil contact has been predicted.

Q Have you any well logs in addition to those previously submitted to the Commission?

A We have copies of electrical logs as conducted by the Schlumberger people, which are both electrical log surveys and mycro-log surveys for the wells that have been completed since the previous hearings before the Commission that you elaborated to preface this hearing. I would like to introduce those as Exhibit C.

(Lowry Oil Company's Exhibit C Marked for Identification)

Q Do those logs show the sand to be - -

A The wells that have been drilled have encountered the same sand conditions that were presented at previous hearings. This is confirmed by the electrical log information.

Q Do you have any corresponding information to submit?

A In addition to the corresponding information submitted at previous hearings we have corresponding analysis of three additional wells. They are the Lowry Well D-39, the Lowry Well T-123 and the Lowry Well T-125. I would like to introduce these corresponding analysis reports as Exhibits D, E and F.

(Lowry Oil Company's Exhibits D, E and F Marked for Identification)

A These Exhibits are being presented to verify that the sand

conditions and reservoir characteristics are virtually the same as presented in previous hearings before the Conservation Commission.

Q Have you prepared a factual data report covering recent operations, Mr. Holland?

A I have a factual data report that I would like to introduce as Exhibit G, I believe.

(Lowry Oil Company's Exhibit G Marked for Identification)

A This contains the test data, the production records and other related matters for the Lowry operated wells of the South Blanco-Tocito Pool.

Q What period does that cover?

A It covers the period from May the first, 1953 through November 30, 1953.

Q Does that cover only the Lowry operated wells?

A Virtually, yes. It includes bottom hole pressure data on one of the Johnson Oil and Gas Company wells, and one production total which includes production through, I believe, October 7, 1953, for all of the wells of the pool. But essentially it covers information only on Lowry operated wells.

Q Is that Exhibit designed to supplement previous Exhibits submitted to the Commission in Cases 537 and 555?

A In those cases a factual data report was submitted, and this report supplements those and brings the information to date through November 30th of this year.

Q Would you state briefly to the Commission what the Exhibit shows?

A The first thing that it shows is the oil and gas production

values for the Lowry wells through November 30, 1953. The production from these wells in total was 781,112 barrels. That was from 12 different wells. Since the last factual data report was presented a pressure maintenance project has been commenced in the field by Lowry operating agent, and water injection has been proceeding since October 7, 1953, in one well. That is the Lowry T-134 Well. Through December 11, 1953 72,834 barrels of water have been injected into this well. The current injection rate approximates 1500 barrels of water per day. The next feature of the data report shows the production values by months for the Lowry wells of the South Blanco-Tocito Pool. In addition there is a production graph showing graphically the field performance as to daily oil production values, daily gas production values and bottom hole pressure performance, number of producing wells in the field and other matters. The next feature of the report is the analysis of the bottom hole pressure tests that have been taken for wells of the south Blanco-Tocito Field. These tests have been conducted on a field wide basis for the Lowry Wells, each three months. Included in this report are the results of the last two pressure surveys which were conducted during August and during October, 1953. Maps used to determine these pressures are also presented in the report. The next feature of the report shows the gas-oil ratio tests and production tests have been taken for the Lowry Wells of this pool, since the day of the last hearing. As the Commission can see, testing has been at rather frequent intervals. One thing I would like to point out in this information is the gas-oil ratio performance for some wells offsetting the water injection well of the pool. Of special interest is the performance

of well T-157 wherein the gas-oil ratio has dropped from approximately 1500 cubic feet per barrel to roughly 800 cubic feet per barrel of gas. There has been a marked reduction in the producing gas-oil ratio of that well.

Q Do you attribute that to your water flooding program?

A Yes. The production rate has changed somewhat but this decrease is believed to be associated with the water program, water injection program. Another well is the T-109. There has been a marked decrease in the ratio of that well. We note that decrease has been within the past ten days and we need to check the well further, but if that test is correct the ratio has decreased a great deal. Some of the other wells, for instance the T-132, the ratio has dropped possibly 200 cubic feet per barrel. Those three wells are believed to be flushed at the present time by the pressure maintenance program and this decrease in producing gas-oil ratio means that less reservoir energy is being consumed in producing oil from the pool than before such a program was commenced. The next feature of the report is the well information which contains the statistical information on the four wells drilled by Lowry that penetrated the Tocito Formation since the date of the previous hearings. The next feature is the corresponding record showing the results of coring operatings conducted since the previous hearings, and the last feature is a record of the drill stem test results for the Lowry wells since the date of the previous hearings.

Q Do you have any oil production figures by wells?

(Lowry Oil Company's Exhibit H Marked for Identification)

A The South Blanco - - first I would like to introduce the oil

production by wells for the Lowry operated wells of the South Blanco-Tocito Pool for the three months September through November, 1953. The wells of the South Blanco-Tocito Pool have not heretofore been prorated by the Conservation Commission and this Exhibit is intended to show the rate at which the wells operated by Lowry have been produced. In summary, some 11 producing wells have been producing 1100 barrels per day. There is a variance in the production rate of some of the wells, part of that is as a result of the wells being of a marginal nature and part of it, three wells especially, T-177, T-182 and T-207 have been curtailed in order to conserve gas. Their ratios are above the two-thousand-to-one limit and those wells have been curtailed for that reason.

Q Does that Exhibit also show your input well?

A It is listed. It had no production during those three months. It was converted to a water injection well on October 7, 1953, and the last production from the well was during August, 1953. It stopped producing because of the conversion.

Q Have you prepared an Exhibit showing reservoir voidage analysis as a result of your water injection program?

A I have, I would like to introduce it as Exhibit I.

(Lowry Oil Company's Exhibit I Marked for Identification)

A This Exhibit is intended to show the Commission the work that is being done, or the energy that is being restored to the reservoir by the South Blanco-Tocito pressure maintenance program. The information reflects that the injection of one barrel of water is the equivalent of restoring 726 cubic feet of gas to the reservoir.

For the month of November, 1953, the production from the Lowry properties average 1118 barrels of oil per day. In terms of reservoir energy or space voidage. The voidage amounted to 2803 barrels per day. The amount of water injected averaged 1387 barrels per day, leaving a net voidage for the Lowry properties of 1416 barrels per day. In summary, it virtually means that half of the energy occurring by oil production from Lowry properties is being restored at the present time to the reservoir.

Q Have you prepared some data showing the effect of production without regard to the gas-oil ratios and with regard to them?

A An Exhibit has been prepared to attempt to show the Commission.

(Lowry Oil Company's Exhibit J Marked for Identification)

A Let me add these remarks, that as the hearing proceeds the Lowry individually request that some flexibility, some lattitude be granted by the Commission in the operation and production of the Lowry Wells. This request is being made in order to best take advantage of the pressure maintenance program in the field and to best operate those properties. Exhibit J, which I would like to introduce, analysis producing rates for the three high gas-oil ratio units operated by Lowry. It shows the production values with no gas-oil ratio limitation based on current statewide allowable figures, and with the gas-oil ratio limitation. By producing without such a limitation the production in excess to that, which it would be, allowed amounts to 144 barrels per day of oil production and some 198 MCF per day of gas production. At the present injection rate of 1500 barrels of water per day the energy restored to the reservoir

exceeds such a difference in reservoir voidage by some 350 barrels. So, forthat reason, if the field is prorated we would like to receive some credit for the conservation program that we have instituted for the field.

Q As a matter of fact you have not produced those wells without regard to the gas-oil ratio, have you?

A We have not. The production figures that were introduced as one of the Exhibits show that.

Q This Exhibit is designed to show the effect only if you did so produce them?

A That is correct.

Q Do you have any recommendation of the proposed plan of allocation of production in the South Blanco-Tocito Pool?

A I have, and I would like to introduce it as Exhibit K.

(Lowry Oil Company's Exhibit K Marked for Identification)

Q Would you discuss briefly the effect of that proposed plan?

A In the operation of a project such as this some flexibility in the program is necessary both in the interest of the operator and the interest of the Conservation Commission. The proposed plan is patterned along the statewide features. It essentially divides the area into wells associated with the pressure maintenance project which are all Lowry operated wells, and another area consisting of operators other than Lowry in the pool, and wells of Lowry that offset such operators. For the wells not associated with the project the plan proposes that they be prorated in accordance with the New Mexico statewide allowable program. For the wells that are

associated with the pressure maintenance project the pattern is the same except that allowance is made for high gas-oil ratio proration units, that because of such a program the wells are not penalized. It makes allowance for wells which are converted to water injection purposes that oil can be produced from some other proration units, and it makes allowance for future conditions whereby proration units will be abandoned because of water encroachment. It sets up somewhat of an area allowable, allowing the operator, in the interest of good reservoir management, to produce the area in accordance with best production practices for such a program and in the interest of ultimate oil recovery and conservation. This proposed plan we would request would be of a temporary nature, possibly three months. It would be associated with the present market demand of the field. It would approximately conform to that, possibly 100 or 200 barrels higher, but in general it does conform to that situation.

Q In connection with the operation of that plan do you think it would be necessary for any tests to be made?

A As this program proceeds, providing it proves to be a satisfactory and feasible program, a number of proration problems will arise before the Commission. There are different operators in the pool. At some future date it might be possible to communitize. That is merely conjecture. For that reason we believe that the Conservation Commission conduct special tests in the pool, to establish records on the wells so that such records can be used in the proration of the pool.

Q Is there anything you would care to add to that, Mr. Holland?

A I believe not, except that I would like to again request that

such a plan be of a temporary nature, and that as far as the Lowry interests are concerned, that if such a request is granted, three months or whatever the period might be, that we will again appear before the Commission showing the performance of such wells and what the production practice has been.

Q Does that recommendation also coincide with the recommendation as made by Mr. Anderson as to market demand?

A In general, yes. One thing I wouldlike to add to delineate an area, which would be termed associated with the repression project,and in general,it is the area to the east of the mid-point of a line through the center of Section 5, 8 and 17, such a line running north and south, these Sections located in Township 26 North, Range 6 West, Rio Arriba County, New Mexico.

Q Would that exclude the wells immediately offsetting those operated by Johnson Oil Company?

A Yes, that is correct.

MR. KELLAHIN: That is all I have. At this time I would like to move the admission of Exhibits A through K,inclusive.

MR. SPURRIER: Without objection they will be admitted.

MR. JOHNSTON: A very good report and very exhaustive, we are all friends, but I am Dan Johnston,with Johnston Oil and Gas, we own offset production both royalty and as operators. I would much rather that our engineers brush through a little bit, I am not saying it isn't a good report. Also there might be some things that I would be subject to criticism to allow if I am here. With your indulgence I would like to ask the friend of Lowry's to continue this hearing, if possible.

MR. KELLEHIN: We have no desire to continue the hearing. The notice was published, if Mr. Johnston has anything to offer we would be happy to hear it. If he wants to examine the records they are certainly available to him. If any steps are going to be taken in this connection I think we ought to go ahead with it.

MR. SPURRIER: Anyone have a question of the witness?

MR. GRAHAM: With reference to the boundaries of the pool, do they feel, as they now exist, they cover the reservoir?

A I believe there are three wells outside the present limits as defined by the Commission. The Johnston Oil and Gas Company has three producing oil wells and the Lowry interests have one well, which is a gas well.

MR. GRAHAM: They are all in the same producing zones?

A They are all in the same producing zones.

MR. GRAHAM: That is all.

MR. KELLAHIN: If the Commission please, I would like to withdraw my objection to any continuance, we have no objection to continuance of the case as requested by Mr. Johnston. However, we do feel it essential in order that a full picture be available, to and that progress won't be delayed, that the well tests we have requested proceed and if the Commission sees fit to do so, why, we have no objection to continuance.

MR. SPURRIER: Do you have anything further?

MR. KELLEHIN: Nothing further.

MR. SPURRIER: Any questions of this witness? If not the witness may be excused. Mr. Johnston, in answer to your motion, we will take the case under advisement and if you have any comments

or any suggestions on the case we will wait until we hear from you.

MR. JOHNSTON: I will not hold the Lowry interest up in any way. It is just like I say, I would like to have a short time. The water flooding and various other aspects of the whole field, and there are some of the things we haven't gone into.

MR. SPURRIER: You realize, of course, that you could file an objection at the next hearing if you care to do so. Does anyone have anything further in this case? If not, we will take the case under advisement. We will take a short recess.

(Recess)

MR. SPURRIER: The next pool in this case is the Rattlesnake-Dakota; Rattlesnake-Pennsylvanian; Red Mountain-Mesaverde; Stoney Butte-Dakota; Table Mesa-Dakota; Table Mesa-Mississippian; Wyper-Farmington. It is understood these pools will be put under the state-wide allocation or some variation. This might be a good time to put you on notice that any pool brought in in the future will automatically go into the statewide system unless the Commission determines differently after due notice and hearing.

We will take the case under advisement and move onto the consideration of the allowable production of gas from the nine designated pools in the southern New Mexico.

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I HEREBY CERTIFY that the foregoing and attached transcript of hearing in Case No. 607 before the Oil Conservation Commission, State of New Mexico, at Santa Fe, on December 17, 1953, is a true and correct record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, New Mexico, this 2 day of January, 1953.

Ada Dearnley
COURT REPORTER

Ex J Case 607
Lowry

SOUTH BLANCO TOCITO POOL

DATA CONCERNING NO GAS OIL RATIO LIMITATION FOR WELLS ASSOCIATED WITH SOUTH BLANCO TOCITO POOL PRESSURE MAINTENANCE PROJECT

NO GAS OIL RATIO LIMITATION

	Daily Allowable, Bbls.	Gas-Oil Ratio, Cu.Ft./Bbl.	Produced Gas, MCF
T-177	111	7252	805
T-182	111	3661	406
T-207	111	2283	253
	333		1,464 MCF

GAS OIL RATIO LIMITATIONS

	Daily Allowable, Bbls.	Gas-Oil Ratio, Cu.Ft./Bbl.	Produced Gas, MCF
T-177	31	7252	222
T-182	61	3661	222
T-207	97	2283	222
	189		666 MCF

ALLOWABLE DIFFERENCE FOR ABOVE TWO STATED CONDITIONS:

144 barrels per day oil production
798 M.C.F. gas per day

VOIDAGE SPACE OF PENALIZED ALLOWABLE:

Oil Voidage

144 bbls x 1.49818 = 216 barrels

Free Gas Voidage

$$\frac{798 \text{ MCF} - 144 \times .834 \text{ MCF}}{.726 \text{ MCF}} = 934 \text{ barrels}$$

TOTAL GROSS VOIDAGE: 1150 barrels

PRESENT DAILY WATER INJECTION RATE: 1500 barrels

WATER INJECTED MINUS PENALIZED ALLOWABLE VOIDAGE:

1500 - 1150 = 350 barrels.

Sec. 6
Case 607

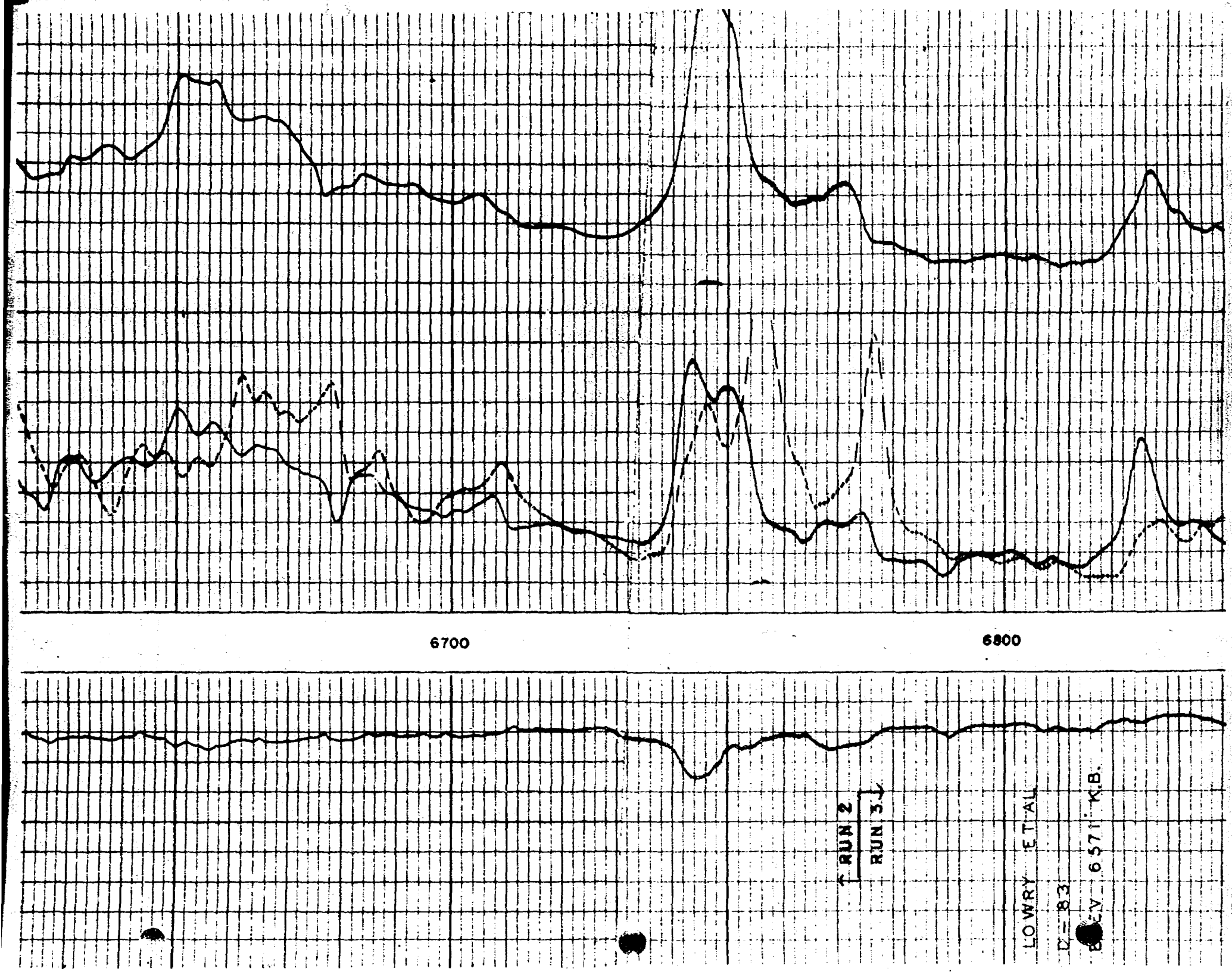
Lowry et al Operating Account

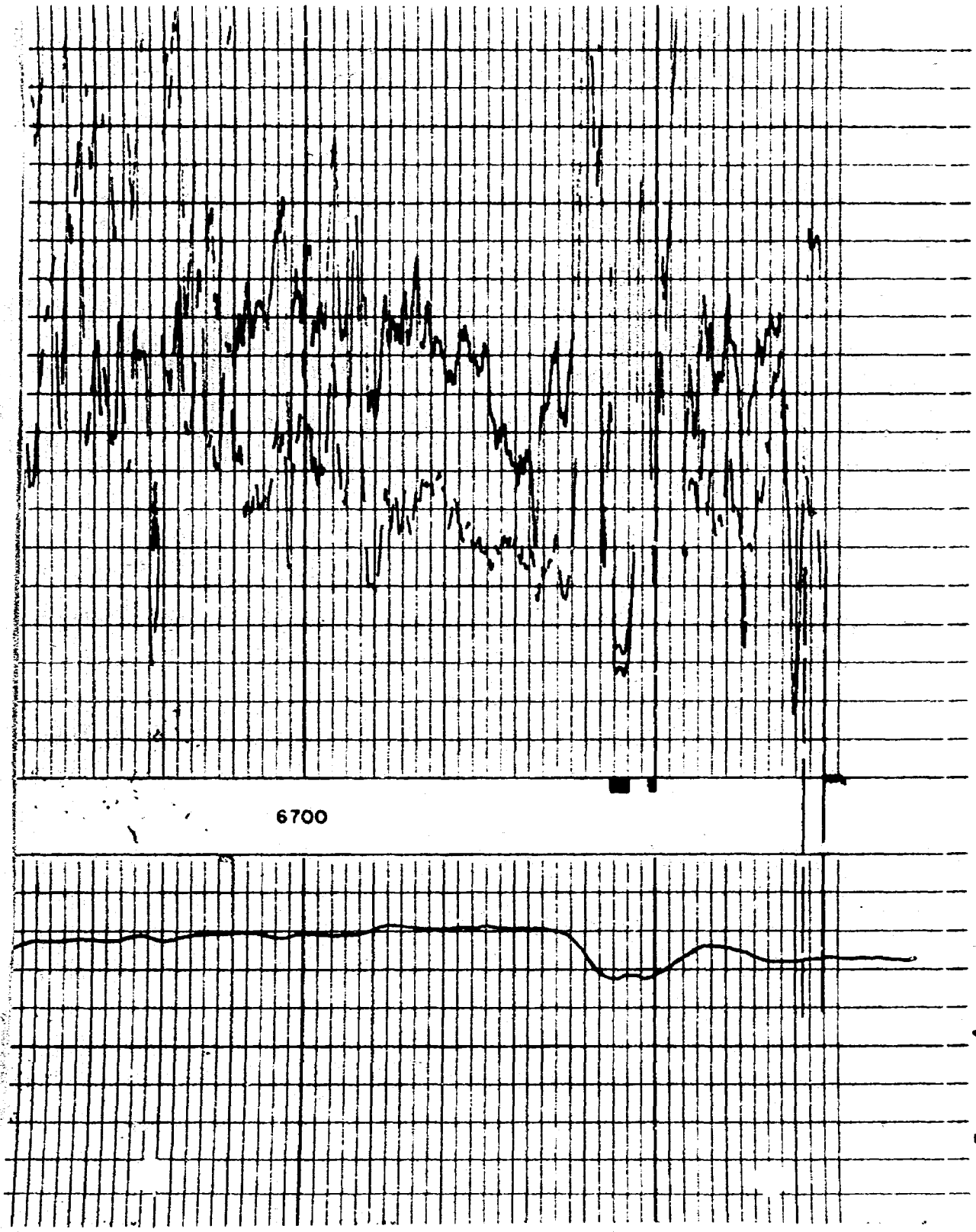
Schlumberger Electric Logs Surveys
and
Schlumberger Microlog Surveys
of
Tocito Sand

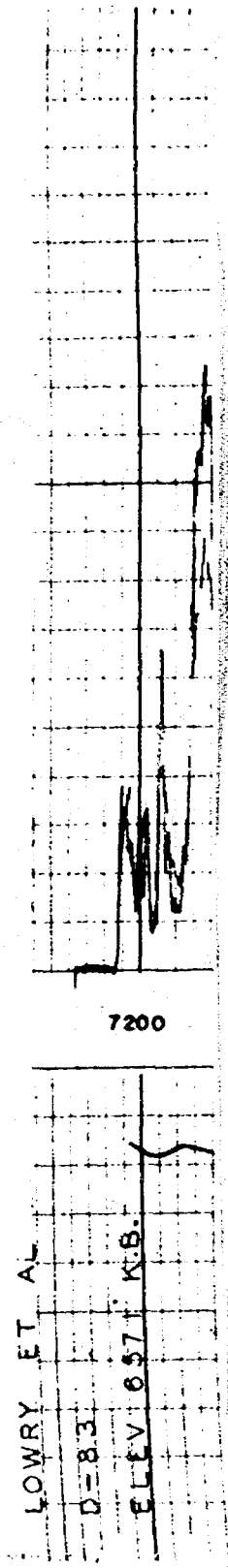
- - - - - - - - - - - - - - - - -

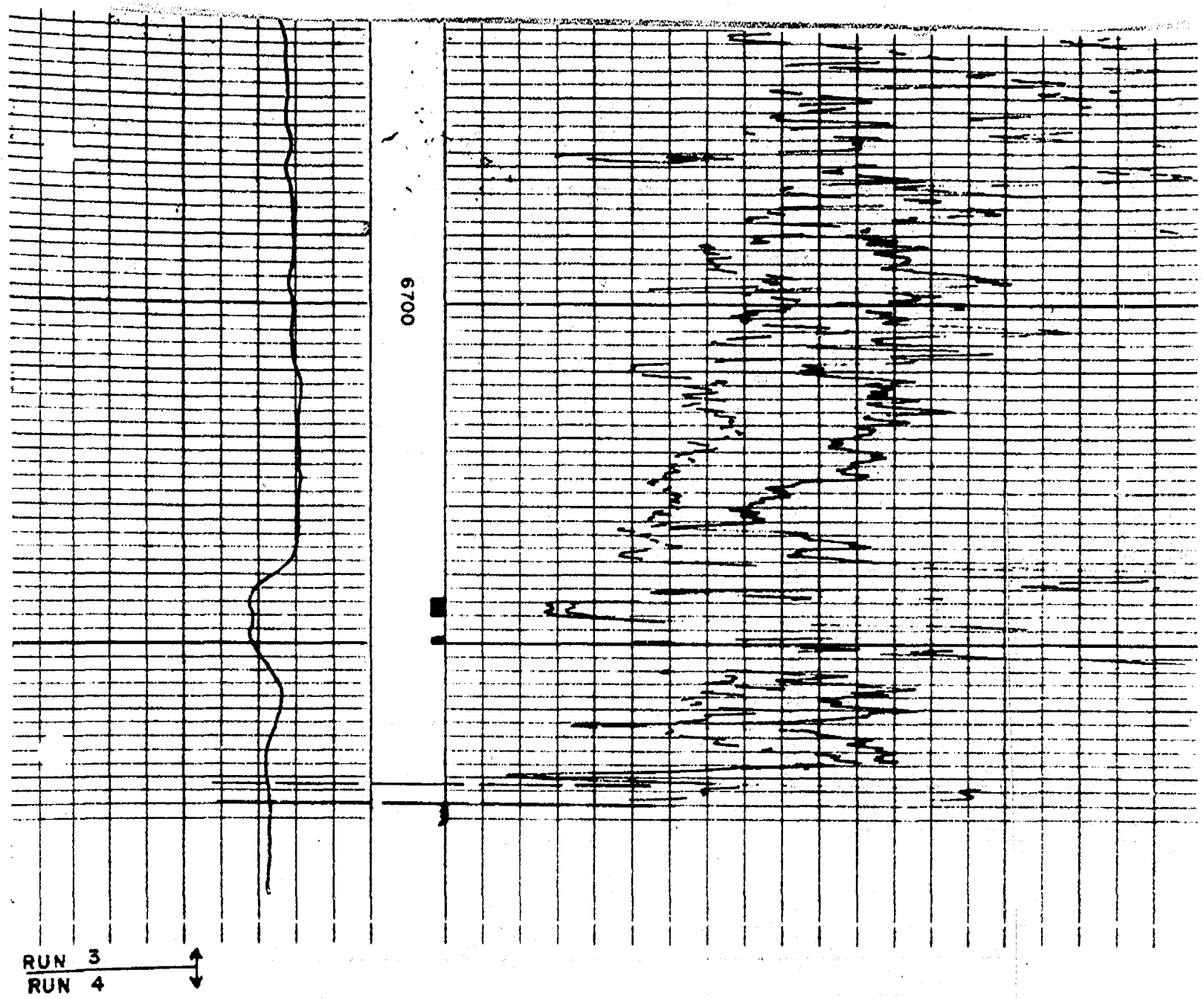
South Blanco Tocito Pool
Rio Arriba County, N. M.

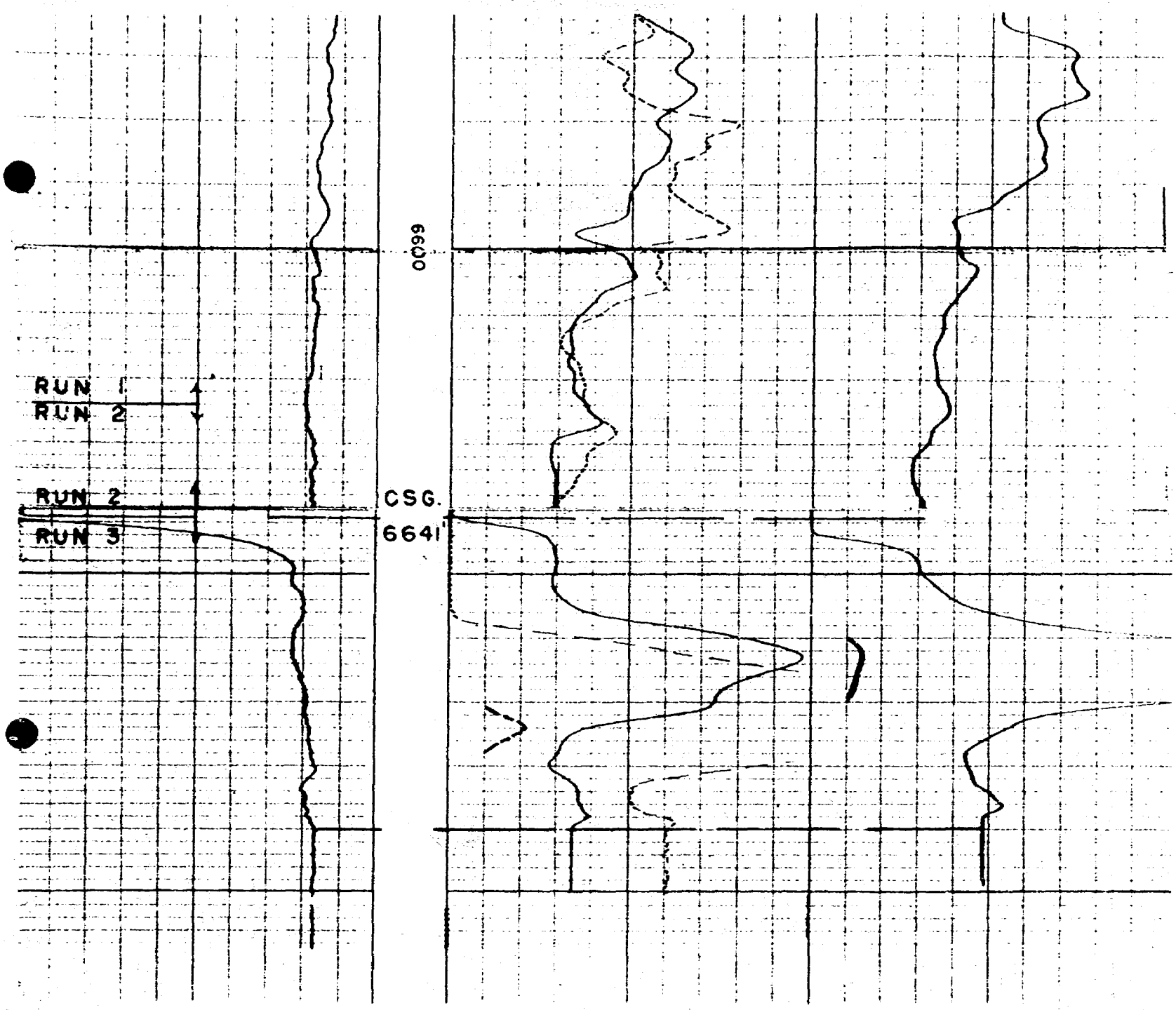
Well No.	Top of Tocito Sand	Elevation	Subsea Datum Top of Tocito Sand
T-85	6658	6483	-175
T-125	6830	6705	-125
T-123	6797	6692	-105
D-83	6740	6571	-169


6700
6800
RUN 2
RUN 3
LOWRY ET AL
D = 83
B.C.V. 6571' K.B.


6700
RUN 3
RUN 4


7200
LOWRY ET AL
D=8.3
ELEV 657 K.B.


6700
RUN 3
RUN 4
LOWRY ET AL
D-8.3
ELEV 6571 K.B.
7200

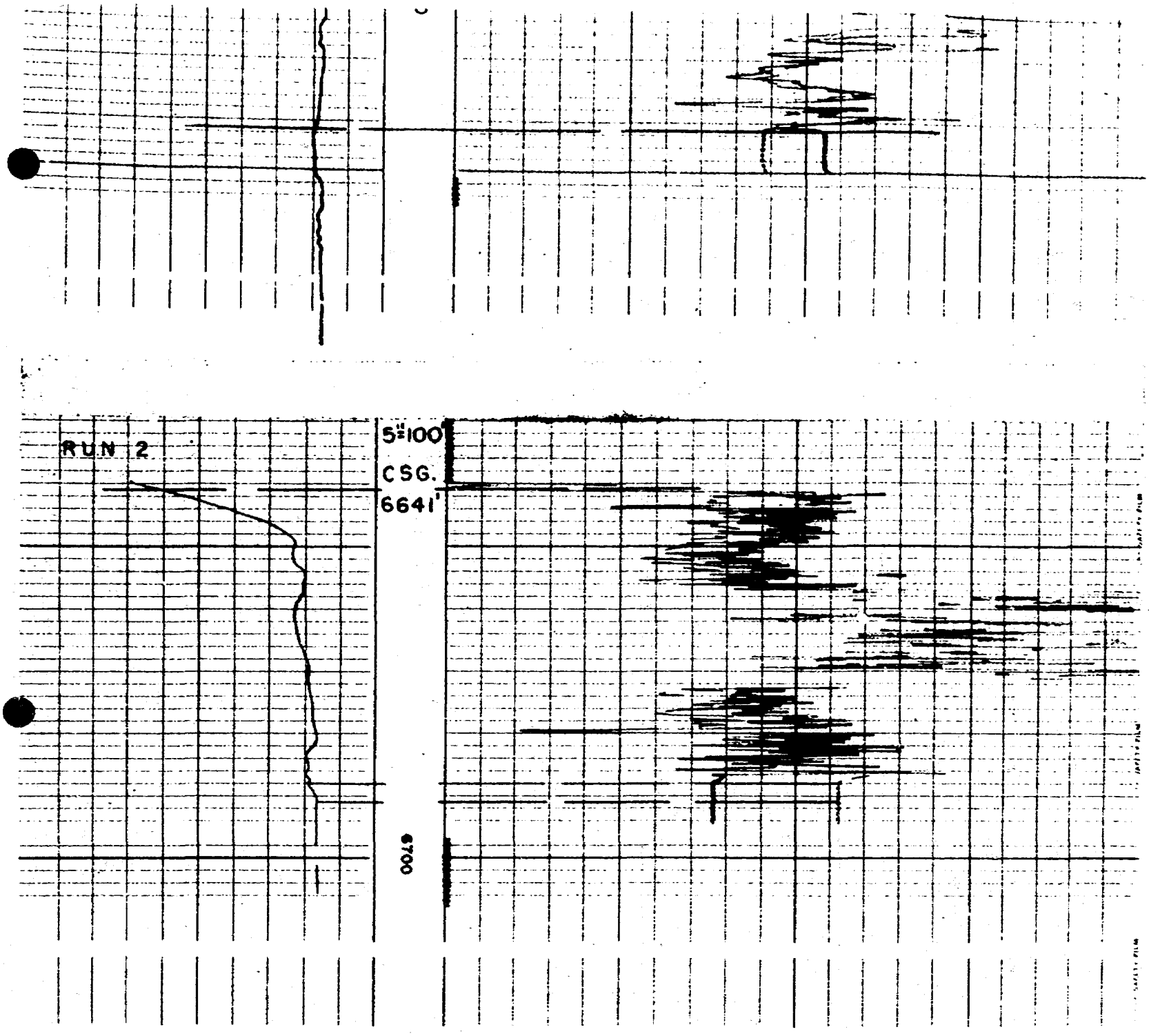


10

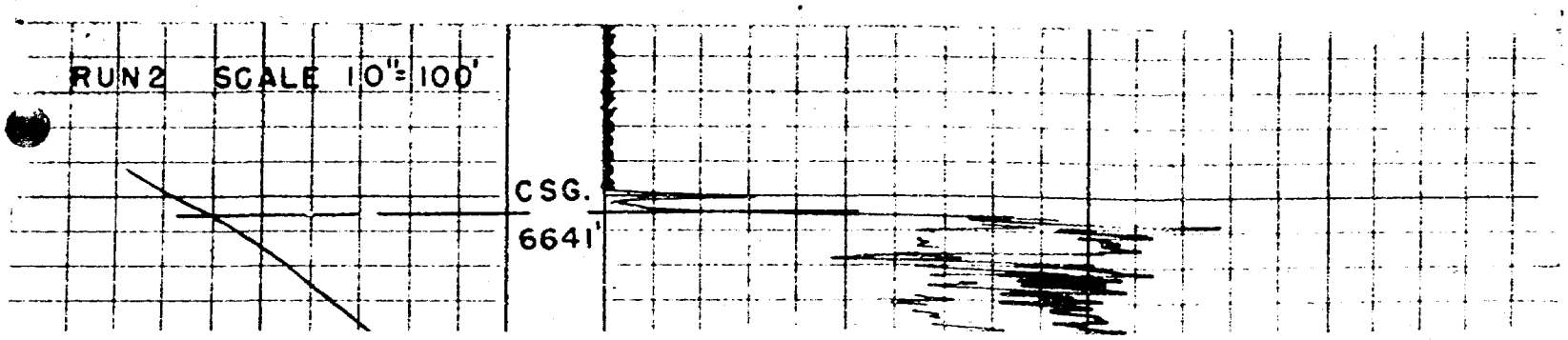
F.R.
6690'

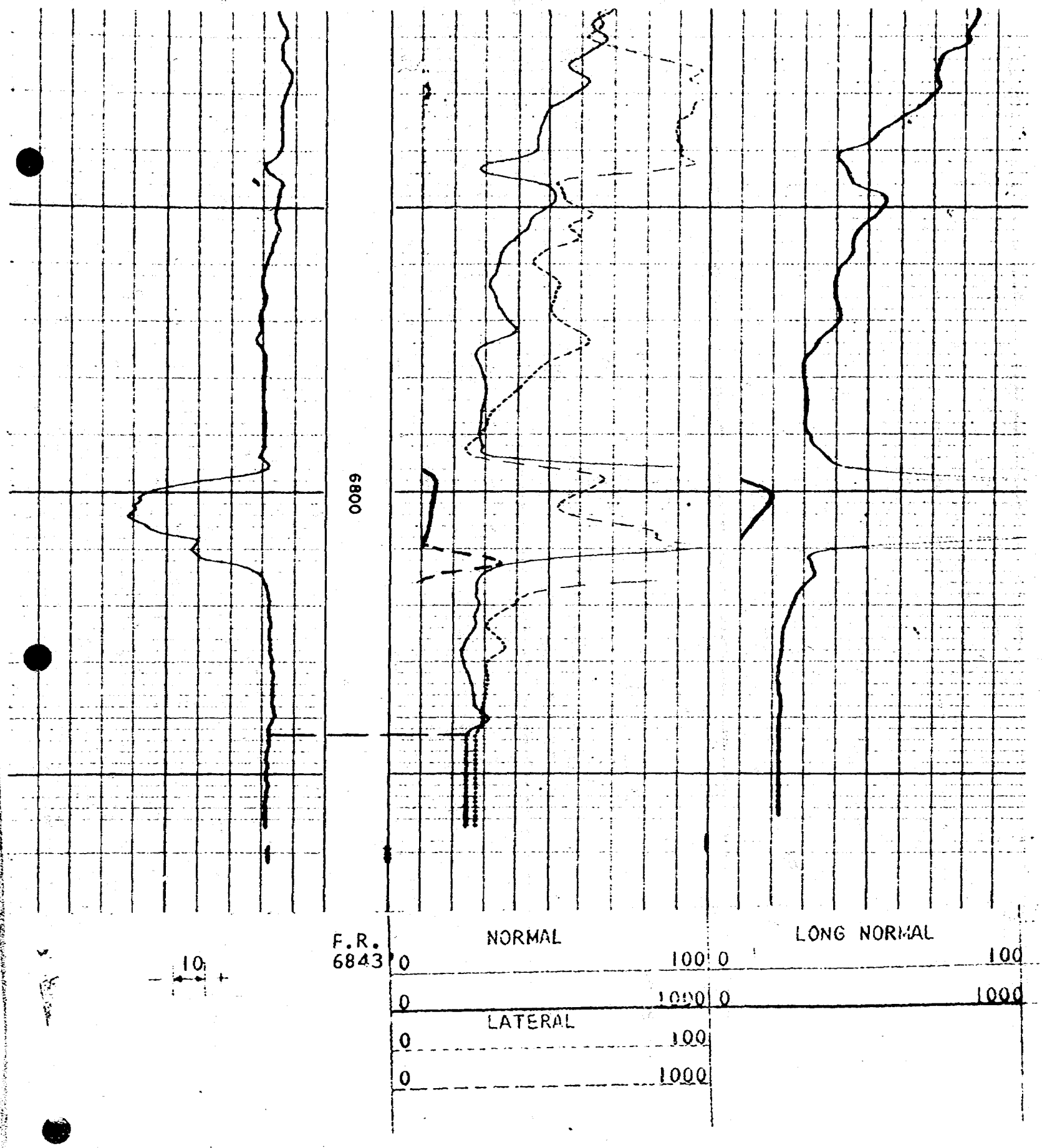
NORMAL		LONG NORMAL	
0	100	0	100
0	1000	0	1000
LATERAL			
0	100		
0	1000		

LOWRY ET AL
FEDERAL #11-52-85
SEC. 4-26N-6W
RIO ARRIBA, NEW MEXICO
ELEV. 6482' D.F.

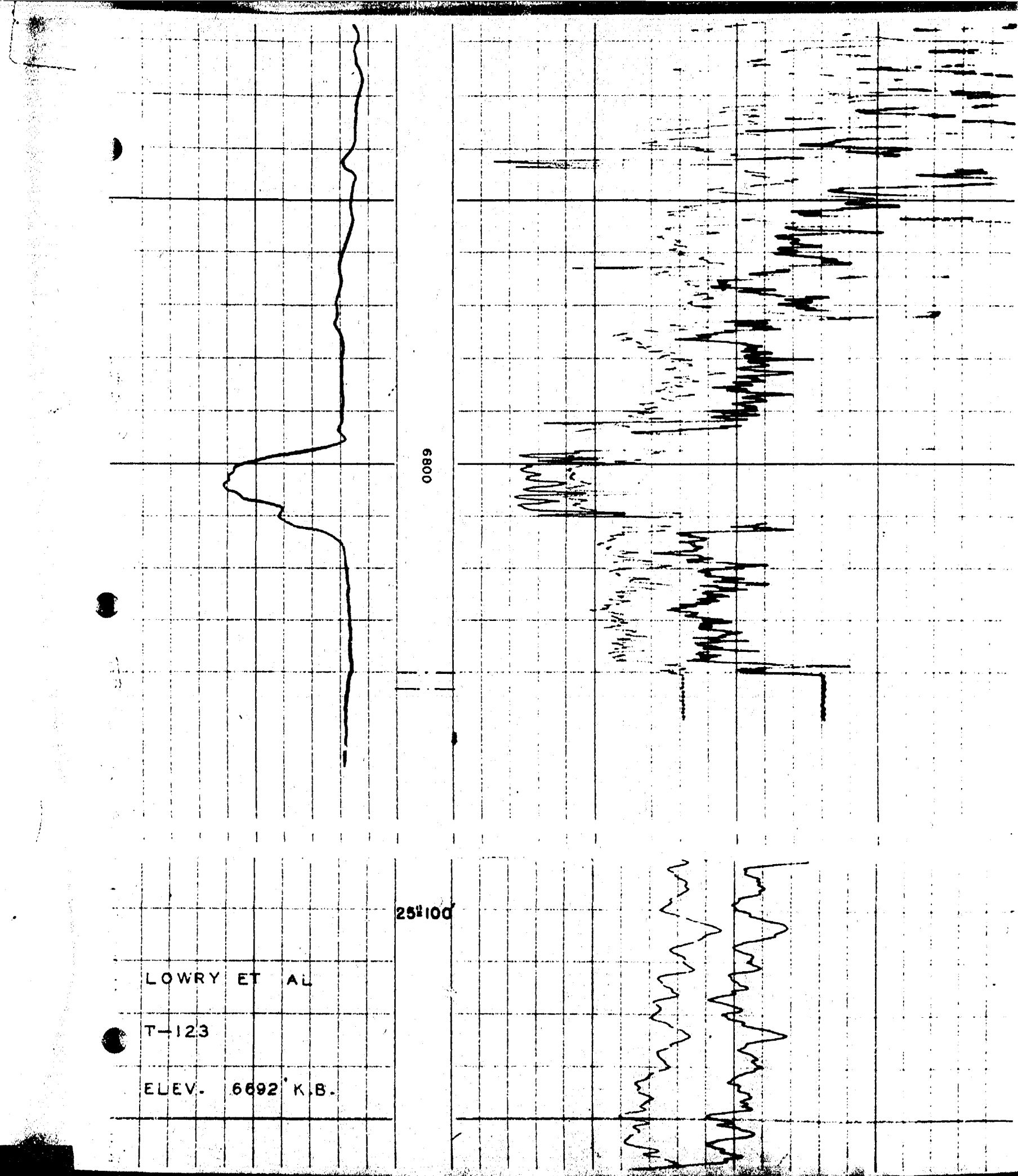


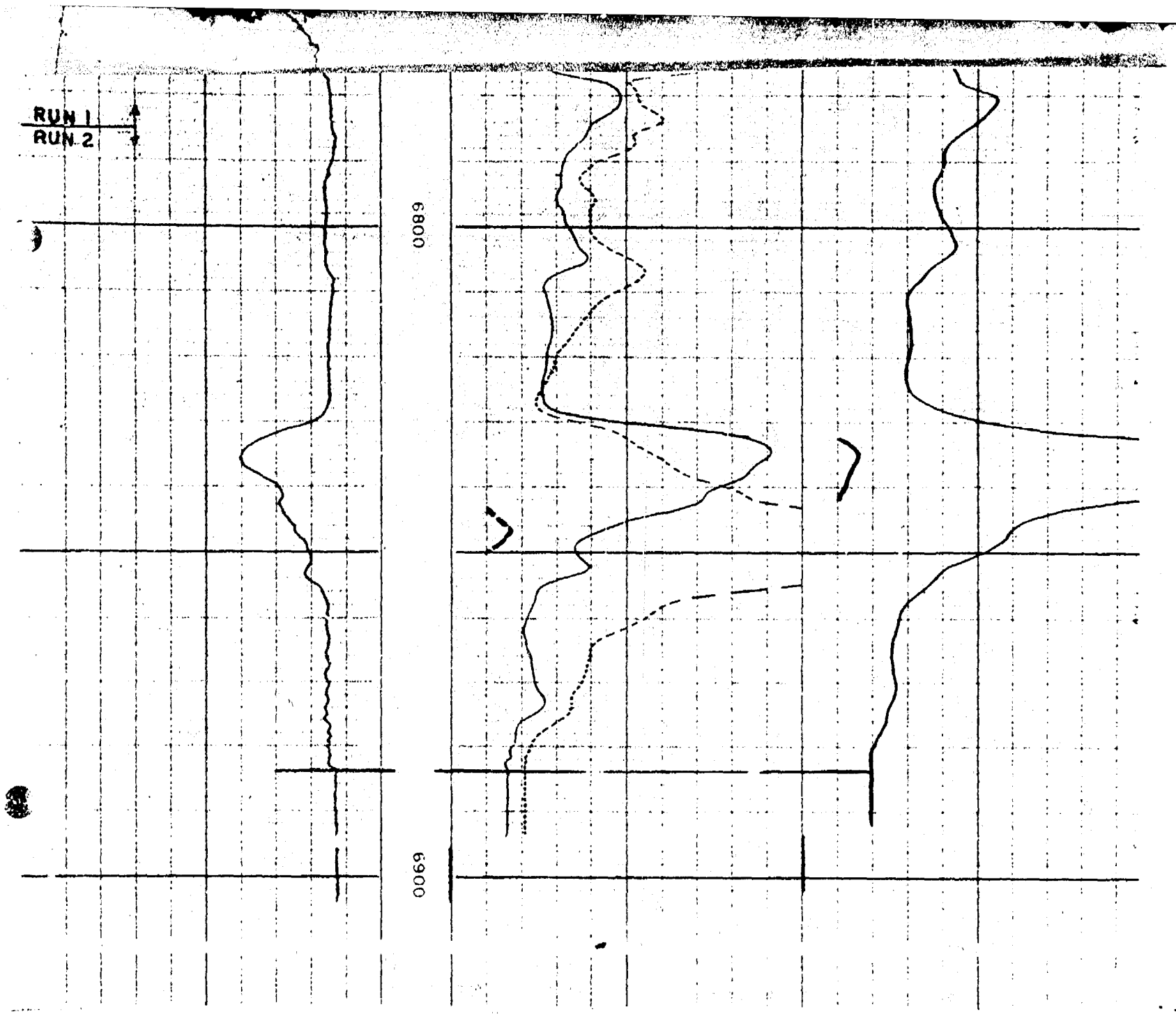
LOWRY ET AL
T-85
ELEV. 6482 D.F.





LOWRY ET AL
FEDERAL T 123
SEC. 7-26N-6W
RIO ARRIBA, NEW MEXICO
ELEV. 6681' G.L.


6800
25"100'
LOWRY ET AL
T-123
ELEV. 6692' K.B.



10

F.R 6884

	NORMAL	LONG NORMAL
	0 — 100	0 — 100
	0 — 1000	0 — 1000
LATERAL	0 - - - 100	
	0 - - - 1000	

LOWRY ET AL
T-125
SEC. 8-26N-6W
RIO ARRIBA, NEW MEXICO
ELEV. 6693' G.L.

RUN 2

5" = 100'

6800

RUN 2

25" = 100'

6800

LOWRY ET AL

125

ELEV. 6705' D.F.

Ex H
Case 607
Lowry

SOUTH BLANCO TOCITO POOL

Lowry et al Operating Account

Oil Production, Barrels

	September, 1953		October, 1953		November, 1953	
	Month	Daily Average	Month	Daily Average	Month	Daily Average
T-85	482	16	429	14	496	17
T-109	2019	67	1753	56	2142	71
T-125	0	0	2184	70	3792	126
T-127	5082	169	5690	183	4082	136
T-129	5082	169	5349	173	4082	136
T-132	2899	97	2410	78	4165	139
* T-134	0	0	0	0	0	0
T-157	4867	162	5296	171	3972	132
T-177	2860	95	2406	78	1853	62
T-179	5085	170	4405	142	4194	140
T-182	0	0	0	0	1581	53
T-207	4909	165	5332	172	3184	106
	33,285	1,110	35,254	1,137	33,543	1,118

* Converted to water injection well.
Last oil production August 1953.

12/2-5

Legal Notice OCC Hearing

Publication:

Date: _____

CASE _____:

Olivia Seth would like to discuss this proposed order with you — and asked if you'd call him as to when he could see you about it — (Tel. 3-7315)

N.

10:20 a.m.

MEMORANDUM TO THE COMMISSION:

SUBJECT:: CASE 607: Commission called hearing for operators in San Juan, Rio Arriba, McKinley and Sandoval Counties to show cause why the oil production in those counties should not be prorated in accordance with Rules 505 of the statewide Rulesand regulations.

RECOMENDATION::

It is recommended that the Commission institute prorationing in the defined oil pools in this 4 county area. In connection with the institution of proration rules must also be applied to take care of all wildcats, and certain special rules should be adopted in order to inaugurate this prorationing procedure.

The order should contain the following pertinent Rules:

1. All of the defined pools should be exempt from Gas Oil ratio limitation with the exception of the South Blanco Tocito. (Exception to Rule 506)

2. All of the pools should be exempt from Rule 301, pertaining to Gas-Oil Ratio tests, with the exception of the South Blanco Tocito.

3.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 607
ORDER NO. R-_____

THE APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION FOR AN
ORDER ALLOCATING THE OIL PRODUCTION
FROM ALL OIL POOLS HERETOFORE OR
HEREAFTER CLASIFIED, DEFINED AND DESCRIBED
IN SAN JUAN, RIO ARRIBA, SANDOVAL AND McKINLEY
COUNTIES, NEW MEXICO IN ACCORDANCE WITH THE
PROVISIONS OF RULE 505 of the Oil CONSERVATION
COMMISSIONS RULES AND REGULATIONS.

ORDER OF THE COMMISSION

BY THE COMMISSION :

This cause came on for hearing at 9:00 o'clock A.M. on December 17, 1953 at Santa Fe, New Mexico, before the Oil cConservation Commission of the State of New Mexico, hereinafter referred to as the "Commission".

NOW, on this _____ day of Februaru,1954, the Commission, a quorum being present, having considered the records and thetestimony adduced, and being fully advised in the premises,

FINDS:

(1) That due notice having been given as required by law the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That oil production from all defined oil pools in the Counties of San Juan, Rio Arriba, Sandoval and McKinley is in excess of the resonable market demand for such oil, and that in order to prevent waste and protect correlative rights the oil production from such pools should be prorated and allocated in accordance with existing Statewide Rules and Regulations as set forth in Section "G" of the Statewide Rules and Regulations, subject to any changes as deemed necessary and advisable due to the producing characteristics of pools presently producing within the above designated four County area.

(3) That production from the Hogback-Dakota Pool shall be allocated in accordance with the plan submitted by the Stanolind Oil and Gas Company, with such revisions as deemed advisable in order to eifectively administer the proration and allocation of oil to the Hogback-Dakota Pool.

(4) That production from the South Blanco-Tocito Pool shall be allocatd in accordance with the plan submitted by the Lowry Oil Company for a temporary period of 4 months, commencing April 1, 1954 and at the regular monthly hearing of the Commission in June, 1954 the operators in the pool appear in this case and outline the proration plan and submit any suggested revisions to the plan so that a permanent proration plan may be devised.

(5) That the following pools shall be allocated and produced in accordance with existing stewide rules as outlined in Section "G" of the Commission Rules and Regulations;

Bloomfield-Farmington; Hospah, Lindrith-Dakota, Hogback-Dakota, Oswell-Farmington, Rattlesnake-Dakota, Rattlesnake-Pennsylvanian, Red Moutain-Mesaverde, Stoney-Butte-Dakota, Table Mesa-Dakota, Table Mesa-Mississippian, Wyper-Farmington, ~~Torreon-Entrada~~, ~~Torreon-Mesaverde~~, and Stoney Butte-Mesaverde,

(6) That an Oil and Gas production test schedule shall be outlined by the Commission, and such tests shall be conducted and supervised by adequately trained Commission engineers in order to determine the actual producing capabily of each well in the pool.

Subscribed and sworn to before me, a notary
in and for the County of Santa Fe,
this ____ day of _____, 19__.

Notary Public

(Seal) My Commission Expires:

IT IS THEREFORE ORDERED:

That the application of the Oil Conservation Commission be and the same hereby is approved as follows:

(1) That the following pools located in San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico, be and the hereby are placed under the provisions of stewide Rules as outlined in Section "C" of the Commissions' Rules and Regulations (with exceptions as noted)

(List Pools under 5)

Provided however that the above listed pools are exempt from Rule 506 pertaining to Gas oil Ratio limitations

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE - NEW MEXICO

STATE OF NEW MEXICO TO:

All operators and parties interested in the oil pools located in San Juan, Rio Arriba, McKinley and Sandoval Counties: NOTICE AND ORDER TO SHOW CAUSE.

CASE 607:

You and each of you are hereby given notice and are hereby ordered to prepare to show cause before the Oil Conservation Commission of New Mexico at Santa Fe, New Mexico, on December 17, 1953, at 9 o'clock a.m. in Mabry Hall, State Capitol, why the following named pools in San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico, should not be classified or re-classified; extended or reduced; created or eliminated; designated or re-designated as to nomenclature and productive formations, respectively; and

Why the oil production, if any, should not be prorated and allocations fixed for the several pools under the provisions of Rule 505 of the statewide Rules and Regulations of the State of New Mexico, as follows:

Bloomfield-Farmington; Hogback-Dakota; Hospah; Lindrith-Dakota; Oswell-Farmington; South Blanco-Tocito; Rattlesnake-Dakota; Rattlesnake-Pennsylvanian; Red Mountain-Mesaverde; Stoney Butte-Dakota; Table Mesa-Dakota; Table Mesa-Mississippian; Wyper-Farmington; and pool designations for wildcat areas where substantial oil production has been encountered in any of the counties named hereinabove.

DONE at Santa Fe, New Mexico, this 27th day of November, 1953, upon motion of the Commission.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

R. R. Spurrier,
Secretary

S E A L

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE - NEW MEXICO

STATE OF NEW MEXICO TO:

All operators and parties interested in the oil pools located in San Juan, Rio Arriba, McKinley and Sandoval Counties:

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Bloomfield-Farmington; Hogback-Dakota; Hospah; Lindrith-Dakota; Oswell-Farmington; South Blanco-Tocito; Rattlesnake-Dakota; Rattlesnake-Pennyslvanian; Red Mountain-Mesaverde; Stoney Butte-Dakota; Table Mesa-Dakota; Table Mesa-Mississippian; Wyper-Farmington; and pool designations for wildcat areas where substantial oil production has been encountered ~~in any~~ in any of the counties named hereinabove.

DONE at Santa Fe, New Mexico, this day of November, 1953, upon motion of the Commission.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

R. R. SPURRIER
SECRETARY

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE - NEW MEXICO

STATE OF NEW MEXICO TO:

All operators and parties interested in the oil pools located in San Juan, Rio Arriba, McKinley and Sandoval Counties:

NOTICE AND ORDER TO SHOW CAUSE

CASE NO. 607 :

You and each of you are hereby given notice and are hereby ordered to prepare to show cause before the Oil Conservation Commission of New Mexico at Santa Fe, New Mexico, on December 17, 1953, at 9 o'clock a.m. in Mabry Hall, State Capitol, why the following named pools in San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico, should not be classified or reclassified; extended or reduced; created or eliminated; designated or redesignated as to nomenclature and productive formations, respectively, and, why The oil production, if any, should not be prorated and allocations fixed for the several pools under the provisions of Rule 505 of the statewide Rules and Regulations of the State of New Mexico, as follows:

Bloomfield-Farmington; Hogback-Dakota; Hospah; Lindrith-Dakota; Oswell-Farmington; South Blanco-Tocito; Rattlesnake-Dakota; Rattlesnake-Pennyslvanian; Red Mountain-Mesaverde; Stoney Butte-Dakota; Table Mesa-Dakota; Table Mesa-Mississippian; Wyper-Farmington; and pool designations for wildcat areas where substantial oil production has been encountered ~~in any~~ in any of the counties named hereinabove.

DONE at Santa Fe, New Mexico, this day of November, 1953, upon motion of the Commission.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

R. R. SPURRIER
SECRETARY

EARLOUGHER ENGINEERING
PETROLEUM CONSULTANTS · CORE ANALYSES
3316 EAST 21ST STREET
TULSA, OKLAHOMA

October 22, 1953

Lowry, et al, Operating Account
616 East Central Avenue
Albuquerque, New Mexico

Attention - Mr. A. F. Lolland

Re - Core Analysis
Lowry Well No. T-125
Sec. 8, T.26-N., R.6-W.
Rio Arriba County, New Mexico

Gentlemen:

Attached are results of analysis, together with profile and summary, covering core received from your above well.

Yours very truly

EARLOUGHER ENGINEERING

R. C. Earlougher, Engineer

JMR tw
Encl 9
cc - T. G. Lowry
A. C. McLee
G. F. Moulton
G. L. Yates

EARLOUGHER ENGINEERING

CORE SUMMARY

Company Lowry, et al, Operating Account Lease Lowry Well No. T-125

Location NW/4 NW/4

Section 8 Twp. 26-N Rge. 6-W County Rio Arriba State New Mexico

Formation Cored Tocito Sand Type Core 4-Inch Diamond

Date Cored 10-8-53 Date Shot Coring Fluid Water Base Mud

Depths:		
	Elevation, K.B., Datum	6705.0 Feet
	Top of core No. 1, shale	6814.0 "
	Top of Tocito oil sand	6830.4 "
	Estimated bottom of Tocito oil sand	6843.0 "
	Bottom of core No. 1, core loss	6855.0 "
	Bottom of core No. 2, shale	6883.0 "
	Net feet of Tocito oil sand recovered	3.0 "
	Total sand thickness from microlog	13.0 "
	Total feet cored	69.0 "
	Feet analyzed	11.0 "
	Estimated net feet of pay from microlog	11.0 "

THE ABOVE CORE DEPTHS HAVE BEEN CORRECTED TO SCHLUMBERGER TOTAL DEPTH OF 6883.0 FEET FROM A DRILLERS TOTAL DEPTH OF 6887.0 FEET.

Shot Record: Set Packer Feet

Depth, Feet From	To	Feet	Shell Diameter	Quarts Per Foot	Quarts Total

Completion Data:

Hrs. well stood after coring ; Feet Fluid in Hole (Oil Water)

Clean-out time, hrs. ; Initial production, bbls. day (Oil Water)

Remarks: The Tocito section was diamond cored from 6814.0 to 6883.0 feet and core sampled by Lowry Oil Company. Coring was commenced and completed in shale.

Core No. 1 from 6814.0 to 6855.0 feet recovered only 3.6 feet of sand and 15.8 feet of shale.

Eleven canned core samples containing all of the sand recovered were received in our laboratory. Samples No. 1, 2, 3 and 4 reportedly represent the top 1.2 feet of Tocito

(Continued following page)

sand. Samples 5, 6, 7, 8 and 9 represent the core recovered between depths 6831.0 to 6843.0 feet. Sample No. 10 reportedly represents the bottom of Core No. 1 at depth of 6855.0 feet. Sample No. 11 reportedly represents the top of Core No. 2 also at 6855.0 feet.

For the purpose of this core report samples No. 5 through 9 are arbitrarily spaced at uniform intervals throughout the section cored from 6831.0 to 6843.0 feet.

Results of these core analyses are summarized in two sections on the basis of variance in permeability and porosity.

Section 1 contains 1.5 net feet of very dense limy sand. Section 2 contains 1.5 net feet of oil sand with good permeability and good porosity.

PERMEABILITY Average permeability of sections 1 and 2 is 0.2 and 414 millidarcys respectively. Individual permeability values in section 2 vary from 57 to 985 millidarcys. Weighted average permeability of the 3.0 net feet of oil sand recovered is 207 millidarcys.

POROSITY Average porosity of sections 1 and 2 is 5.7 and 19.2 per cent, respectively. Weighted average porosity of the 3.0 feet of oil sand recovered is 12.5 per cent. Individual porosity values vary from 3.6 to 21.3 per cent in the oil sand section.

PER CENT SATURATION The 1.5 net feet of oil sand recovered in section 1 has a high average oil saturation of 43 per cent and average core water saturation of 13 per cent reflecting the very low permeability and porosity of this sand. The more permeable sand recovered in section 2 has an average core oil saturation of 29 per cent and average core water saturation of 28 per cent. The over-all average oil saturation is 36 per cent and average core

water saturation 21 per cent. Estimated average connate water saturation is 18 per cent.

OIL CONTENT Average oil content of the dense sand in section 1 is 190 barrels per acre-foot while that of the more permeable sand in section 2 is 432 barrels per acre-foot. Weighted average oil content of the oil sand recovered is 311 barrels per acre-foot.

LABORATORY WATER FLOODING TESTS Laboratory water flooding tests on 1 sample from the very dense sand in section 1 indicated a residual oil saturation of 41 per cent and showed no oil recovery. Permeability to water was very low in this one sample. Two flood samples from the more permeable sand in section 2 indicated an average residual oil saturation of 25 per cent and showed no oil recovery. Permeability to water was high in section 2.

CONCLUSIONS

1. Only 3.0 net feet of oil sand were recovered. Coring time and Electrical log indicated total sand thickness of 13 feet between depths 6830.0 and 6843.0 feet.

2. The core recovered indicates 1.5 net feet of sand with a high average permeability of 414 millidarcys and high average porosity of 19.2 per cent. The remaining 1.5 net feet of oil sand recovered has a low average permeability of 0.2 millidarcy and low average porosity of 5.7 per cent.

3. Based on the core data for the 1.5 feet of high permeability sand recovered it is estimated that a primary oil recovery by gas expansion of 194 barrels per acre-foot may be obtained from the area of which this

core is representative. If reservoir pressure is maintained by an efficient water drive it is estimated that an additional oil recovery of 154 barrels per acre-foot should result.

4. From the microlog it is estimated there may be 11 net feet of oil pay having relatively high permeability and porosity approaching that of the 1.5 feet of good sand recovered in the core.

5. On the basis of 11 net feet of pay the estimated primary oil recovery should be 2140 barrels per acre with an additional 1690 barrels per acre by pressure maintenance using water.

Respectfully submitted

EARLOUGHER ENGINEERING

J. M. Robinson, Engineer

JMR tw

EARLOUGHER ENGINEERING

SUMMARY OF CORE ANALYSES DATA

COMPANY Lowry, et al Operating Account LEASE Lowry WELL NO. T-125

Sec.	Formation	Depth, Ft. From	Depth, Ft. To	Net Ft. of Sand	Avg. Por.	Avg. Core Saturation Oil	Avg. Core Saturation Water	Core Oil Content Avg. B/A. Ft.	Core Oil Content Total B/Ac.	Permeability Avg. Md.	Permeability Capacity Ft. x Md.	Flood Pot Residuals Saturation Oil	Flood Pot Residuals Saturation Water	Flood Pot Residuals Oil Content B/A. Ft.	Flood Pot Residuals Oil Content B/Ac.	Oil Recovery Bbl./Acre Diff.	Oil Recovery Bbl./Acre Flood Pot
	TOCITO																
1	0.0 - 5. md.	6830.4	6843.0	1.5*	5.7	43.	13.	190.	--	0.2	--	41.	41.	181.	--	--	+
2	over 6. md.	6830.4	6843.0	1.5*	19.2	29.	28.	432.	--	414.	--	25.	57.	372.	--	--	+
1-2		6830.4	6843.0	3.0*	12.5	36.	21.	311.	--	207.	--	33.	49.	277.	--	--	+
	Oil pay	6831.	6843.	11.**	19.2	29.	28.	432.	--	414.	--	25.	57.	372.	--	--	--

* Does not include core loss. Recovered only 3.0 feet of oil sand. Core depths are corrected to electric log depths.

** Estimated from micro log.

EARLOUGHER ENGINEERING

RESULTS OF CORE ANALYSES

COMPANY Lowery et al, Operating Account WELL Lowry No. T-125

Sample No.	Depth Feet	Perm. Md.	Porosity Per Cent	Per Cent Saturation			Avg. Oil Content Bbl./A. Ft.	Remarks
				Oil	Water	Total		
0	6829.6	Shale	not analyzed					
1	6830.0	-0-	3.5	75.	25.	100.	200.	Limey conglomerate*
2	6830.3	-0-	4.2	40.	50.	90.	130.	Limey conglomerate*
3	6830.6	0.2	3.6	44.	18.	62.	120.	Limey conglomerate
4	6830.9	-0-	4.7	52.	13.	65.	190.	Limey conglomerate
5	6832.4	0.4	6.9	39.	14.	53.	210.	Limey conglomerate
6	6835.2	983.	21.3	28.	27.	55.	460.	Sl limey carb sd
7	6838.0	0.2	7.4	36.	8.	44.	210.	Limey carb sd
8	6840.8	202.	19.0	29.	26.	55.	420.	Sl shly carb sd
9	6842.0	57.	17.4	30.	31.	61.	410.	Sl limey carb sd
10	6855.	-0-	2.8	16.	52.	68.	35.	Shly carb sd *
11	6855.0-6855.4	0.1	1.7	74.	26.	100.	97.	Sandy shale *

* Not included in averages.

Note: Samples No. 5 - 9 spaced uniformly thru section 6831. - 6843.

SUMMARY

Depth, Feet From	Depth, Feet To	Feet of Sand	Average Permeability	Average Porosity	Avg. Oil Sat.	Avg. Water Sat.	Avg. Oil Content Bbl./A. Ft.

FORM CE 104

EARLOUGHER ENGINEERING

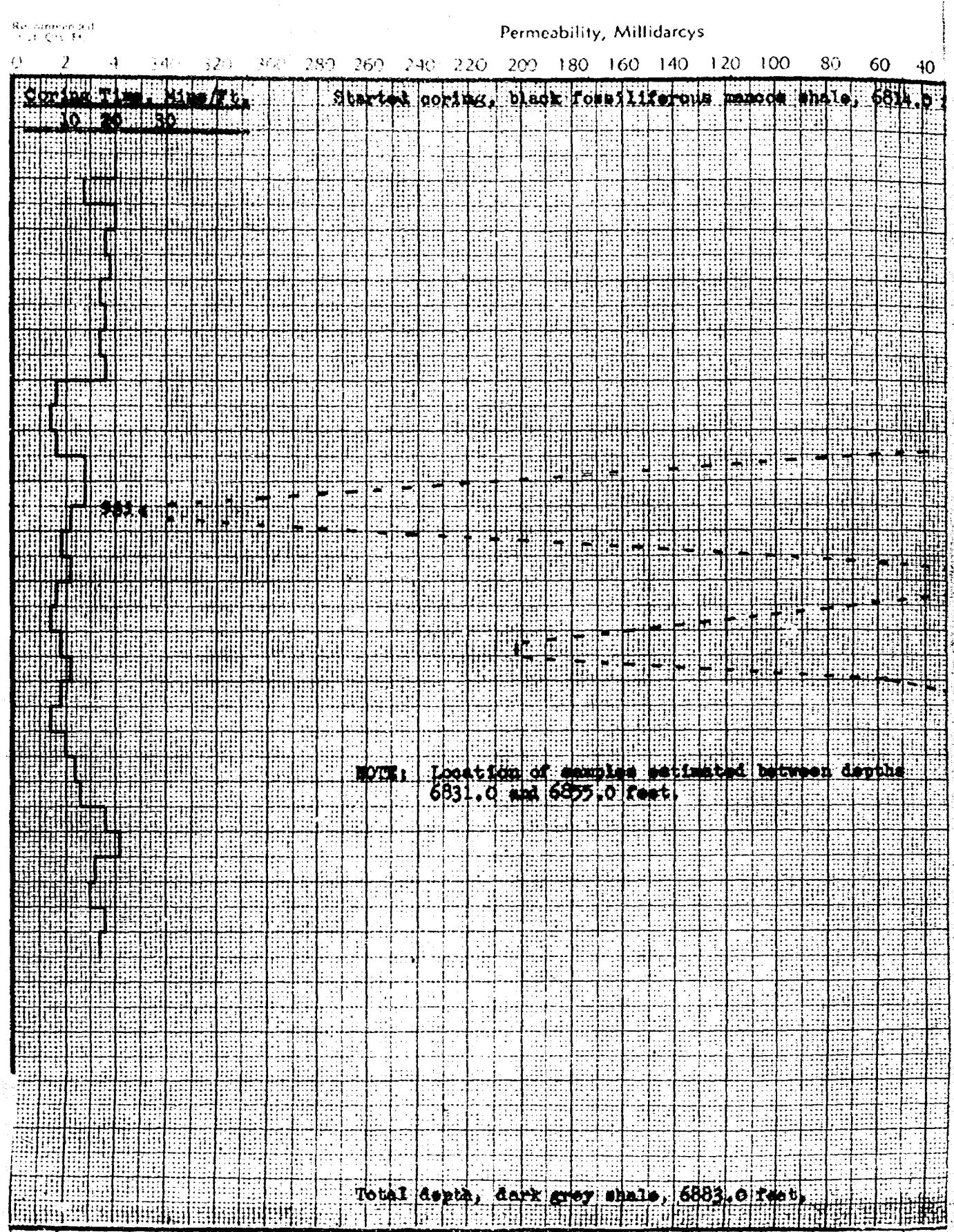
RESULTS OF LABORATORY FLOODING TESTS

COMPANY Lowry, et al, Operating Account LEASE Lowry WELL NO. T-125

Sample No.	Depth	Porosity	Perm. Approx.	Before Flooding 1/ Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.	Max. Press. Psi.	Water Through C.C.	Time Min.	Flood Pot Residual Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.	Flood Pot Oil Recovery Bbl./A. Ft.	
F-2	6830.3	4.2	IMP	55.	--	180.	70.	-0-	375.	55.	45.	180.	-0-	
F-4	6830.9	4.7	IMP	41.	--	150.	70.	42.	375.	41.	41.	150.	+	
F-6	6835.2	21.3	983.	21.	--	340.	40-70.	7,594.	375.	21.	57.	340.	+	
F-8	6840.8	19.0	202.	29.	--	420.	40-70.	8,892.	375.	29.	56.	420.	+	

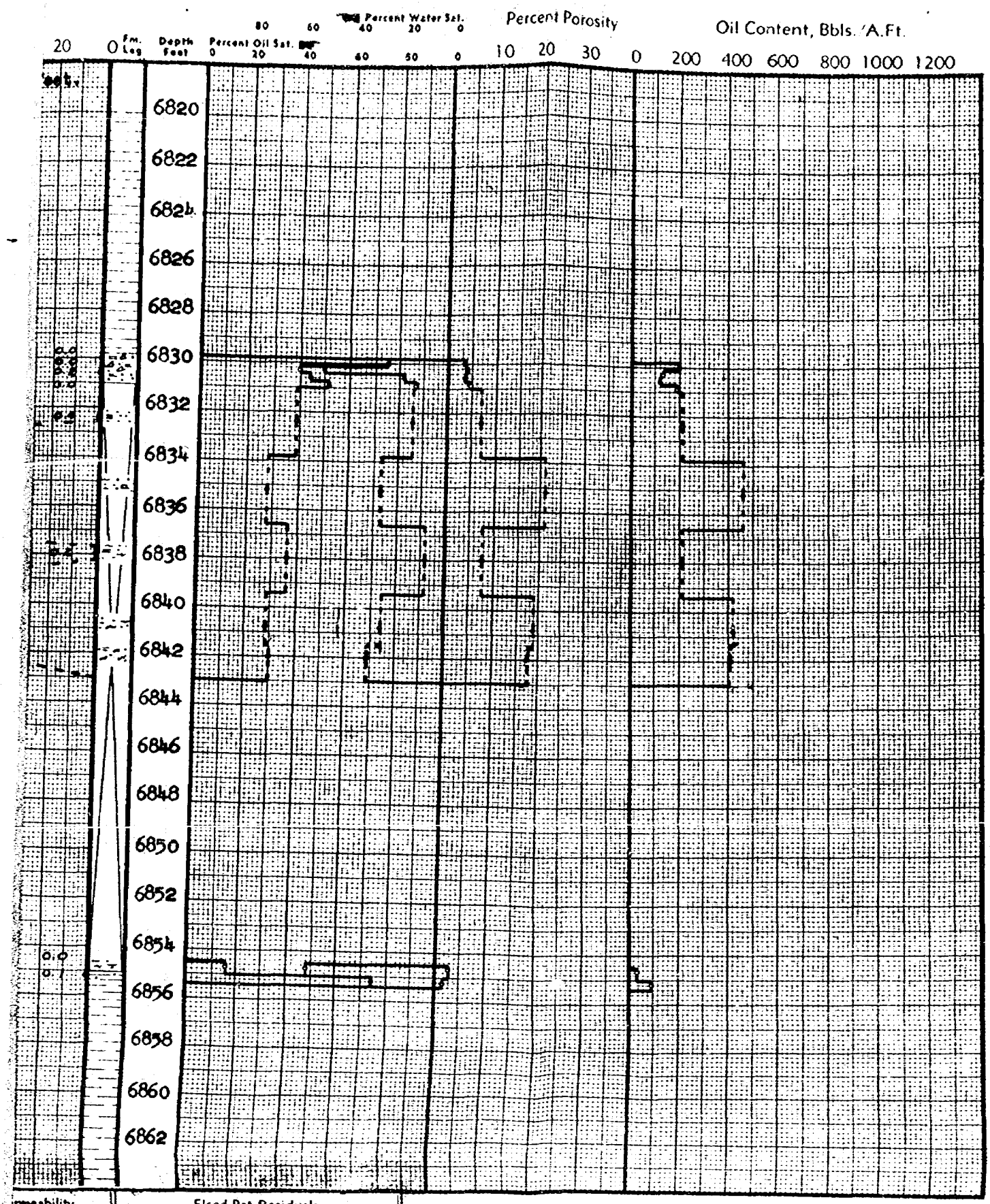
JB

1/ Unless otherwise noted, oil content and saturation before flooding equals flood pot oil recovery plus flood pot residual.



Sec.	Sand	Depth, Feet From	Depth, Feet To	Net Ft. of Sand	Avg. Por.	Average Core Sat. Oil	Average Core Sat. Water	Core Oil Content Avg. B./A.Ft.	Core Oil Content Total Bbl./Ac.	Pe Avg. Mds.
	TOCITO (Arithmetic Averages)									
1	0.0 - 5. Md.	6830.4	6845.0	1.5*	5.7	43.	13.	190.	--	0.
2	Over 6. Md.	6830.4	6845.0	1.5*	19.2	29.	28.	432.	--	414.
1-2	--	6830.4	6845.0	3.0*	12.5	36.	21.	311.	--	207.
	Oil Pay	6831.0	6843.0	11.0**	19.2	29.	28.	432.		414.

*Does not include core loss. Recovered only 3.0 feet of
Core depths are corrected to electric log depths
**Estimated from micro log.



...meability		Flood Pot Residuals			
	Capacity Ft. x Md.	Saturation Oil	Saturation Water	Oil Content B /A Ft.	Oil Content Bbl /Ac.
2	--	41.	41.	181.	--
—	--	25.	57.	372.	--
	--	33.	49.	277.	--
		25.	57.	372.	--

...11 sand.

COMPANY LOWRY, ET AL, OPERATING ACCOUNT
LEASE LOWRY WELL NO T-125
LOCATION NW/4 NW/4
SEC. 8 T 26-N R 6-W COUNTY Rio Arriba
STATE New Mexico DATE 10-22-53

EARLOUGHER ENGINEERING TULSA, OKLAHOMA

EARLOUGHER ENGINEERING
PETROLEUM CONSULTANTS - CORE ANALYSES
3316 EAST 21ST STREET
TULSA, OKLAHOMA

July 27, 1953

Lowry, et al, Operating Account
616 East Central Avenue
Albuquerque, New Mexico

Attention - Mr. A. F. Holland

Re: Core Analysis
Federal Well No. T-83
Sec 5, T.26-N, R.6-W
Rio Arriba County, New Mexico

Gentlemen:

Attached are complete results of analysis, together with profile and summary, covering core received from your above well. This replaces preliminary report submitted July 18, 1953.

Yours very truly

EARLOUGHER ENGINEERING

R. C. Earlougher, Engineer

ABL d
Encl 9
cc - T. G. Lowry
A. C. McLee
G. F. Moulton
G. L. Yates

EARLOUGHER ENGINEERING

CORE SUMMARY

Company Lowry, et al, Operating Acc't Lease Federal Well No. T-83

Location NW SE/4

Section 5 Twp. 26-N Rge. 6-W County Rio Arriba State New Mexico

Formation Cored Tocito Type Core 4-3/8 inch Diamond

Date Cored 7-15-53 Date Shot _____ Coring Fluid _____

Depths:

Elevation, Kelly Bushing (14 ft above ground)	6573.0 ft
Top of core, sandy black shale	6741.5 "
Top of oil sand	6744.0 "
Bottom of oil sand	6754.0 "
Bottom of core, sandy black shale	6758.0 "
Net feet of oil sand	8.2 "
Total cored	16.5 "
Feet analyzed	15.4 "

Shot Record: Set Packer _____ Feet

Depth, Feet From	To	Feet	Shell Diameter	Quarts Per Foot	Quarts Total

Completion Data:

Hrs. well stood after coring _____; Feet Fluid In Hole _____ (Oil _____ Water _____)

Clean-out time, hrs. _____; Initial production, bbls. day _____ (Oil _____ Water _____)

Remarks: The Tocito sand section between depths of 6741.5 and 6758.0 feet was sampled by Lowry Oil Company. Sixteen samples sealed in aluminum foil were sent in by air express with balance of core in this interval being sent by Railway Express.

Results of analyses indicated 8.2 net feet of dense, possible oil sand between depths 6744.0 and 6754.0 feet. The core data are summarized in two sections with section 1 containing sand having permeability values ranging from 0.1 to 5 millidarcys

(Continued following page)

and section 2 sand with values greater than 6 millidarcys. These data indicate only 1.1 feet of sand in section 2 and 7.1 feet in section 1.

PERMEABILITY Average permeability of sections 1 and 2 is 1.5 and 19 millidarcys with the weighted average being 3.9 millidarcys. Permeability capacity is 32 foot-millidarcys.

POROSITY Weighted average porosity is 10.6 per cent with the individual sections 1 and 2 having average values of 10.1 and 14.1 per cent respectively.

PER CENT SATURATION Average oil saturation of the 8.2 net feet of oil sand is 32 per cent and average core water saturation 21 per cent. Estimated connate water saturation is 21 per cent.

OIL CONTENT Average core oil content is 261 barrels per acre-foot and values range from 170 to 330 barrels per acre-foot.

LABORATORY FLOODING TESTS Laboratory water flooding tests yielded no oil recovery and average residual oil saturation was 33 per cent. Average radial permeability to water was 0.105 millidarcy for the 8.2 net feet of pay section. Average permeability to water for four samples excluded from the pay section because of porosity values of less than 8 per cent was 0.029 millidarcy.

CONCLUSIONS

1. Net feet of oil sand is 8.2 located between depths 6744.0 and 6754.0 feet.

2. The sand has a low average permeability of 3.9 millidarcys and low average porosity of 10.6 per cent.

3. The average core oil saturation is 32 per cent and average core water saturation 21 per cent.

4. Laboratory water flooding tests yielded no oil recovery and permeability to water was very low with an average of 0.105 millidarcy.

5. Estimated primary oil recovery by gas expansion is 79 barrels per acre-foot or 650 barrels per acre from the area of which this core is representative.

6. If reservoir pressure is maintained by an efficient water drive an additional oil recovery of 45 barrels per acre-foot or 370 barrels per acre should be obtained.

7. In view of the very low permeability capacity, the natural rate of production probably would be negligible. However, permeability and drainage radius probably could be increased by a fracture treatment.

8. With the present wide spacing in this pool such fracture treatment might not be detrimental in a water injection program.

Respectfully submitted

EARLOUGHER ENGINEERING

J. M. Robinson, Engineer

R/L d

EARLOUGHER ENGINEERING

RESULTS OF SATURATION TESTS

COMPANY Lowry , et al Operating Account WELL Federal No. T-83

Sat. No.	Depth Feet	Porosity Per Cent	Per Cent Saturation			Avg. Oil Content Bbl./A. Ft.	Feet of Sand		Total Oil Content Bbl./Acre
			Oil	Water	Total		Ft.	Cum.	
1	6742.6	6.4	46.	22.	68.	230.	0.8*		
2	6743.4	7.1	34.	37.	71.	190.	1.2*		
3	6744.5	9.8	28.	16.	44.	210.	0.8	0.8	170.
4	6745.7	10.5	34.	15.	49.	280.	1.2	2.0	340.
5	6746.7	8.9	40.	13.	53.	270.	0.9	2.9	240.
6	6747.7	9.4	44.	21.	65.	320.	0.8	3.7	260.
7	6748.7	14.1	31.	19.	50.	330.	1.1	4.8	360.
8	6749.7	11.2	28.	21.	49.	240.	0.9	5.7	220.
9	6750.6	10.2	35.	18.	53.	280.	0.9	6.6	250.
10	6751.6	8.8	25.	35.	60.	170.	0.6	7.2	100.
11	6752.3	4.8	45.	21.	66.	170.	1.6*		
12	6753.4	10.9	26.	26.	52.	220.	1.0	8.2	220.
13	6754.7	7.4	32.	9.	41.	190.	1.2*		
14	6755.7	4.6	50.	15.	65.	180.	1.3*		
15	6756.8	4.9	43.	12.	55.	160.	0.5*		
16	6757.5	4.1	35.	50.	85.	110.	0.6*		

* Not included in cumulative feet of sand.

Jg

EARLOUGHER ENGINEERING

RESULTS OF PERMEABILITY TESTS

COMPANY Lowry, et al Operating Account WELL Federal No. T-83

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Sand		Capacity Ft. X Md.	Sample No.	Depth Feet	Permeability Millidarcys	Feet of Sand		Capacity Ft. X Md.
			Ft.	Cum. Ft.					Ft.	Cum. Ft.	
17	6742.1	IMP	0.5*			25	6750.2	14.	0.5	5.7	7.0
1	6742.6	IMP	0.3*			9	6750.6	2.1	0.4	6.1	0.8
18	6743.0	0.1	0.4*			26	6750.9	0.5	0.5	6.6	0.3
2	6743.4	0.1	0.8*			10	6751.6	0.6	0.6	7.2	0.4
19	6744.2	0.6	0.3	0.3	0.2	11	6752.3	0.1	0.6*		
3	6744.5	0.2	0.5	0.8	0.1	28	6753.0	0.2	0.4*		
20	6745.1	0.9	0.5	1.3	0.5	12	6753.4	1.4	0.6	7.8	0.8
4	6745.7	2.2	0.7	2.0	1.5	29	6753.8	1.3	0.4	8.2	0.5
21	6746.2	0.6	0.5	2.5	0.3	13	6754.7	0.1	1.0*		
5	6746 7	0.3	0.4	2.9	0.1	30	6755.2	0.6	0.2*		
22	6747.2	0.1	0.6*			14	6755.7	0.1	0.8*		
6	6747.7	0.5	0.3	3.2	0.2	31	6756.2	0.1	0.5*		
23	6748.2	4.6	0.5	3.7	2.3	15	6756.8	0.2	0.5*		
7	6748.7	23.	0.6	4.3	14.	16	6757.5	0.6	0.6*		
24	6749.2	1.5	0.4	4.7	0.6	32	6757.9	IMP	0.4*		
8	6749.7	4.5	0.5	5.2	2.3						

* Not included in cumulative feet of sand.

jg

EARLOUGHER ENGINEERING

SUMMARY OF CORE ANALYSES DATA

COMPANY Lowry, et al Operating Account LEASE Federal WELL NO. T-83

Sec.	Formation	Depth, Ft. From	Depth, Ft. To	Net Ft. of Sand	Avg. Por.	Avg. Core Saturation Oil	Avg. Core Saturation Water	Core Oil Content Avg. B/A. Ft.	Core Oil Content Total B/Ac.	Permeability Avg. Md.	Permeability Capacity Ft. x Md.	Flood Pot Residuals Saturation Oil	Flood Pot Residuals Saturation Water	Flood Pot Residuals Oil Content B/A. Ft.	Flood Pot Residuals Oil Content B/Ac.	Oil Recovery Bbl./Acre Diff.	Oil Recovery Bbl./Acre Flood Pot
	TOCITO SAND																
1	0.1 to 5. md	6744.0	6754.0	7.1	10.1	32.	21.	254.	1800.	1.5	11.	34.	49.	266.	1890.	-0-	-0-
2	Above 6. md	6744.0	6754.0	1.1	14.1	31.	19.	330.	340.	19.	21.	31.	53.	330.	340.	-0-	-0-
1-2		6744.0	6754.0	8.2	10.6	32.	21.	261.	2140.	3.9	32.	33.	50.	272.	2230.	-0-	-0-

JB

EARLOUGHER ENGINEERING

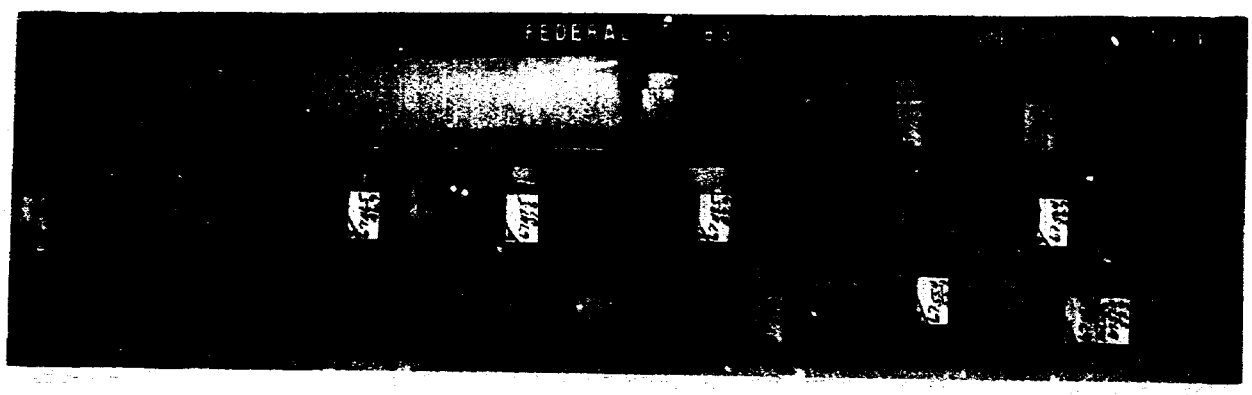
RESULTS OF LABORATORY FLOODING TESTS

COMPANY Lowry, et al Operating Account LEASE Federal WELL NO. T-83

Sample No.	Depth	Porosity	Perm. Approx.	Before Flooding 1/ Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.	Max. Press. Psi.	Water Through C.C.	Time Min.	Flood Pot Residual Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.	Flood Pot Oil Recovery Bbl./A. Ft.	Radial Perm. to Fresh Water, md at 70 psi.
*F-1	6742.6	6.4	-0-	44.	--	220.	70.	+	480.	44.	41.	220.	-0-	--
F-3	6744.5	9.8	0.2	32.	--	240.	70.	155.	480.	32.	57.	240.	-0-	0.060
F-5	6746.7	8.9	0.3	38.	--	260.	70.	60.	480.	38.	48.	260.	-0-	0.041
F-7	6748.7	14.1	23.	31.	--	330.	70.	485.	480.	31.	53.	330.	-0-	0.306
F-9	6750.6	10.2	2.1	32.	--	250.	70.	15.	480.	32.	42.	250.	-0-	0.011
*F-11	6752.3	4.8	0.1	44.	--	160.	70.	38.	480.	44.	41.	160.	-0-	0.033
*F-13	6754.7	7.4	0.1	25.	--	140.	70.	19.	480.	25.	66.	140.	-0-	0.013
*F-15	6756.8	4.9	0.2	49.	--	190.	70.	35.	480.	49.	51.	190.	-0-	0.010
												Average		0.105

* Not included in averages

1/ Unless otherwise noted, oil content and saturation before flooding equals flood pot oil recovery plus flood pot residual.



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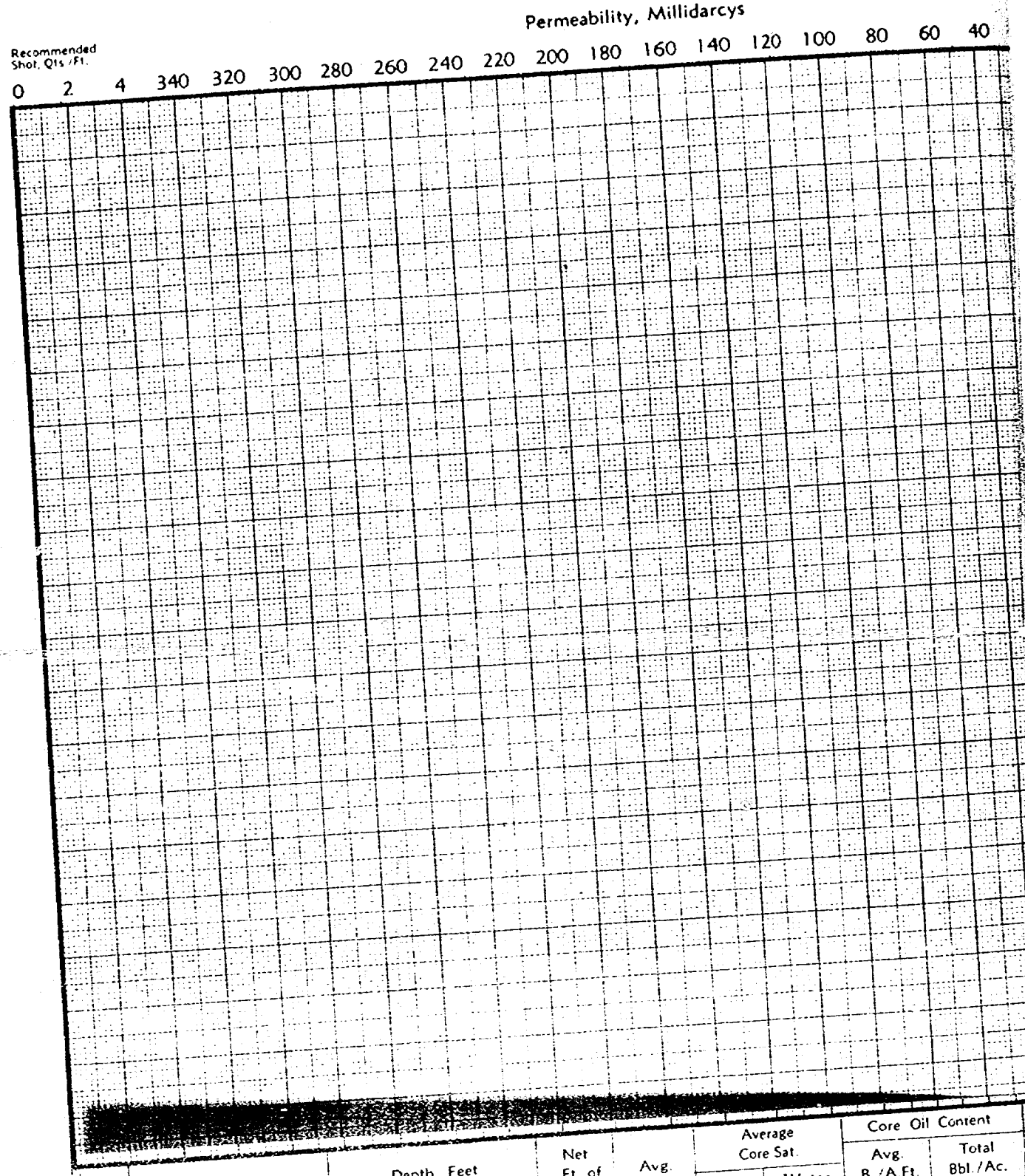
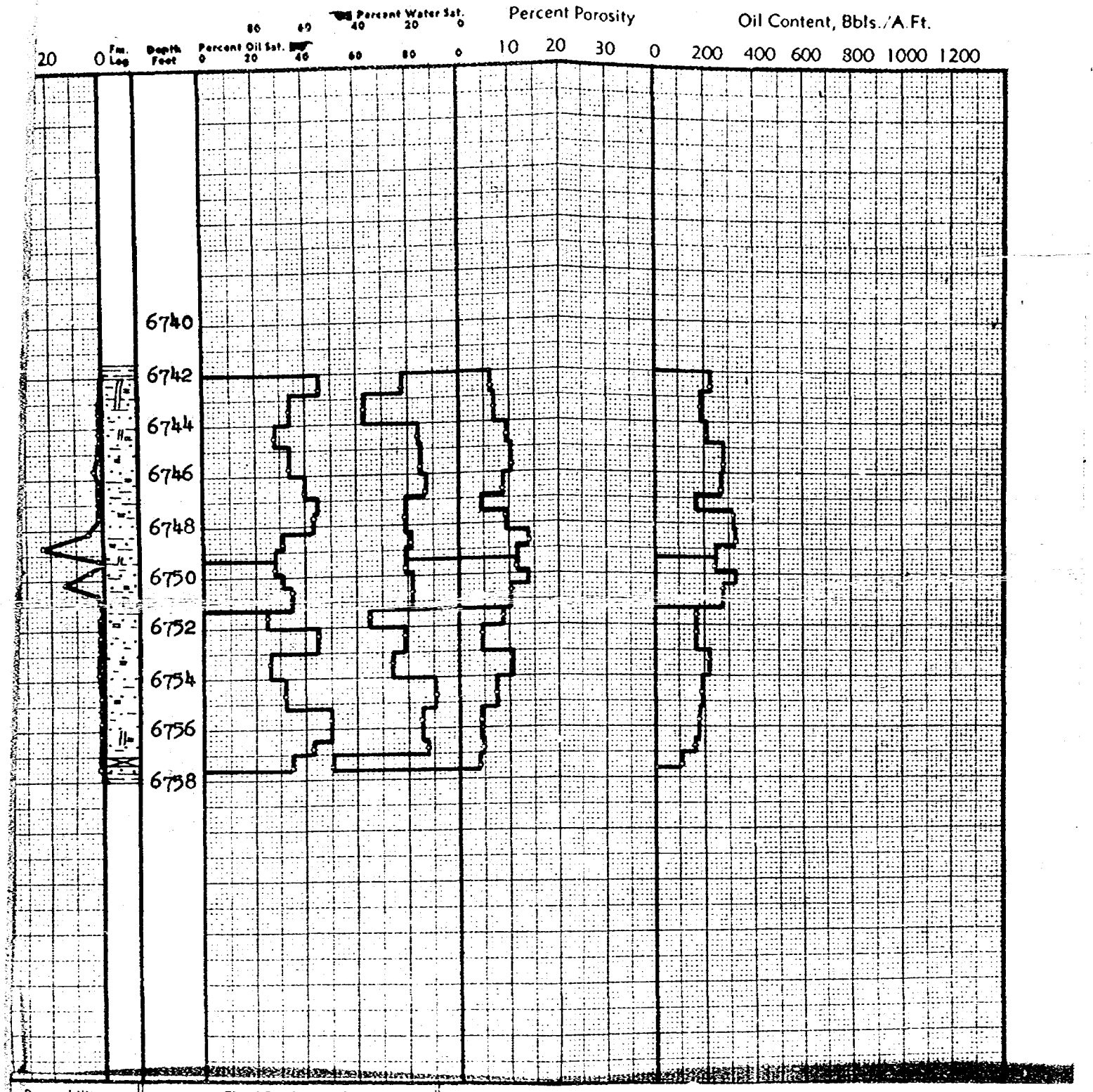


Sec.	Sand	Depth, Feet From	Depth, Feet To	Net Ft. of Sand	Avg. Por.	Average Core Sat. Oil	Average Core Sat. Water	Core Oil Content Avg. B./A.Ft.	Core Oil Content Total Bbl./Ac.
	TOCITO SAND								
1	0.1 to 5. md	6744.0	6754.0	7.1	10.1	32.	21.	254.	1,800.
2	Above 6. md	6744.0	6754.0	1.1	14.1	31.	19.	330.	340.
1-2		6744.0	6754.0	8.2	10.6	32.	21.	261.	2,140.



Permeability		Flood Pot Residuals			
		Saturation		Oil Content	
Avg Mds.	Capacity Ft. x Md.	Oil	Water	B./A Ft	Bbl./Ac.
1.5	11.	34.	49.	266.	1,890.
19.	21.	31.	53.	330.	340.
3.9	32.	33.	50.	272.	2,230.

COMPANY LOWRY, ET AL, OPERATING ACCOUNT
LEASE FEDERAL WELL NO. T-83
LOCATION NW SE/4
SEC. 5 T 26N R 6W COUNTY Rio Arriba
STATE New Mexico DATE 7-27-53

EARLOUGHER ENGINEERING TULSA, OKLAHOMA

EARLOUGHER ENGINEERING
PETROLEUM CONSULTANTS - CORE ANALYSES
3316 EAST 21ST STREET
TULSA, OKLAHOMA

December 7, 1953

Lowry, et al Operating Account
616 East Central Avenue
Albuquerque, New Mexico

Attention - Mr. A. F. Holland

Re - Core Analysis
Federal Well No. T-123
Sec. 7, T.26-N., R.6-W.
Rio Arriba County, New Mexico

Gentlemen:

Attached are results of analysis, together with profile and summary, covering core received from your above well.

Chlorids and sulfate content of the core water have been determined and will be submitted in a separate report.

Yours very truly

EARLOUGHER ENGINEERING

R. C. Earlougher

R. C. Earlougher, Engineer

JMR tw
Encl 9
cc - T. G. Lowry
A. C. McLee
G. F. Moulton
G. L. Yates

EARLOUGHER ENGINEERING

CORE SUMMARY

Company Lowry, et al Operating Account Lease Federal Well No. T-123

Location 700 feet from North Line, 1800 feet from East Line

Section 7 Twp. 26-N Rge. 6-W County Rio Arriba State New Mexico

Formation Cored Tocito Sand Type Core 4-Inch Diamond

Date Cored 11-22-53 Date Shot _____ Coring Fluid Water Base Mud

Depths:

Elevation, ground level	6681.0	Feet
Elevation, K.B., datum	6692.0	"
Started coring, shale	6795.0	"
Top of Tocito sand, dense possible gas sd	6797.7	"
Top of main porous section	6800.8	"
Top of possible oil sand	6807.5	"
Bottom of possible oil sand	6810.7	"
Bottom of dense limy sand	6811.5	"
Bottom of core recovered, shale	6816.5	"
Bottom of core, core loss	6845.0	"
Net feet of Tocito sand	13.4	"
Feet analyzed	15.0	"

Shot Record: Set Packer _____ Feet

Depth, Feet From	To	Feet	Shell Diameter	Quarts Per Foot	Quarts Total

Casing set and cemented at 6844.0 Feet
Drilled out to 6832.0 "
Perforated with 6 shots per foot from 6797 to 6812 feet.
Estimated open flow of 10 million cubic feet of gas per day and some distillate of 66° A.P.I. at 60/60 F.

Completion Data:

Hrs. well stood after coring _____; Feet Fluid in Hole _____ (Oil _____ Water _____)

Clean-out time, hrs. _____; Initial production, bbls. day _____ (Oil _____ Water _____)

Remarks: The Tocito section was diamond cored from 6795.0 to 6845.0 feet and core sampled by Lowry Oil Company. Core recovery was 21.5 feet with the top 2 feet being shale and the bottom 5 feet shale. The remaining 14.5 feet of core recovered was Tocito sand. MicroLog indicates that the entire Tocito sand section was recovered in the core.

Results of analyses indicate 13.4 net feet of Tocito sand between depths 6797.7 and 6811.5 feet. The core data indicate 5.8 net feet of this sand to have an average permeability of 0.2 millidarcys with values ranging from 0.1 to 0.3 millidarcy. The

(Continued following page)

remaining 7.6 net feet of the Tocito sand has a good average permeability of 104 millidarcys with values ranging from 1.1 to 495 millidarcys.

The 5.8 net feet of very dense Tocito has an average porosity of 5.6 per cent and is very nearly a sandy limestone. The average oil saturation is 32 per cent and average core water saturation 21 per cent.

The 7.6 net feet of more permeable sand has an average porosity of 16.4 per cent with individual values ranging from 8.9 to 20.6 per cent.

The core data for the 7.6 net feet of more permeable sand have been summarized in 3 sections, 2-A, 2-B and 2-C based on variance in oil saturation. These data indicate an average oil saturation of 15 per cent for the top 1.9 net feet, an average oil saturation of 19 per cent for the next 2.9 net feet and an average oil saturation of 30 per cent for the bottom 2.8 net feet. Average permeability for the 3 sections 2-A, 2-B and 2-C is 54, 226 and 10 millidarcys respectively. These saturation data may be interpreted to indicate oil sand in the bottom 2.8 net feet and possible gas with possibly some oil in the top 4.8 net feet.

Assuming 2.8 net feet of oil sand it is estimated that a primary oil recovery of 400 barrels per acre may be obtained from the area of which this core is representative. If reservoir pressure is maintained by an effective water drive it is possible that an additional oil recovery of 400 barrels per acre may be obtained.

JMR tw

EARLOUGHER ENGINEERING

SUMMARY OF CORE ANALYSES DATA

COMPANY Lowry, et al, Operating Account LEASE Federal WELL NO. T-123

Sec.	Formation	Depth, Ft.		Net Ft. of Sand	Avg. Por.	Avg. Core Saturation		Core Oil Content		Permeability		Flood Pot Residuals				Oil Recovery Bbl./Acre	
												Saturation		Oil Content			
		From	To			Oil	Water	Avg. B/A. Ft.	Total B/Ac.	Avg. Md.	Capacity Ft. x Md.	Oil	Water	B/A. Ft.	B/Ac.	Diff.	Flood Pot
1	0.1 - 1.0 md.	6797.7	6811.5	5.8	5.6	32.	21.	141.	820.	0.2	1.1	20.	44.	87.	500.	320.	-0-
2	Over 1.0 md	6800.8	6810.7	7.6	16.4	22.	27.	278.	2110.	104.	788.	22.	58.	276.	2100.	10.	-0-
1&2		6797.7	6811.5	13.4	11.7	24.	24.	219.	2930.	59.	789.	21.	52.	194.	2600.	330.	-0-
2A	Poss. gas	6800.8	6803.3	1.9	16.3	15.	33.	190.	360.	54.	103.	19.	60.	240.	460.	-0-	-0-
2B	Poss. gas-oil	6803.3	6807.1	2.9	18.7	19.	28.	283.	820.	226.	657.	17.	58.	246.	710.	110.	-0-
2C	Oil	6807.5	6810.7	2.8	14.1	30.	22.	332.	930.	10.	28.	30.	58.	332.	930.	-0-	-0-

EARLOUGHER ENGINEERING

RESULTS OF SATURATION TESTS

COMPANY Lowry, et al, Operating Account WELL Federal No. T-123

Sat. No.	Depth Feet	Porosity Per Cent	Per Cent Saturation			Avg. Oil Content Bbl./A. Ft.	Feet of Sand		Total Oil Content Bbl./Acre
			Oil	Water	Total		Ft.	Cum.	
1	6797.3	2.9	59.	40.	99.	130.	0.7*		
2	6798.2	6.4	26.	16.	42.	130.	1.5	1.5	200.
3	6799.7	7.7	20.	14.	34.	120.	0.6	2.1	72.
4	6800.2	5.4	42.	12.	54.	180.	2.2	4.3	400.
5	6801.1	15.4	19.	49.	68.	230.	0.7	5.0	160.
6	6802.1	16.6	14.	25.	39.	180.	0.6	5.6	110.
7	6803.1	16.9	12.	25.	37.	150.	0.6	6.2	90.
8	6804.7	20.6	19.	26.	45.	300.	1.7	7.9	510.
9	6805.4	14.5	22.	25.	47.	250.	0.6	8.5	150.
10	6806.7	17.7	19.	33.	52.	260.	0.6	9.1	160.
11	6807.7	15.1	28.	20.	48.	330.	0.7	9.8	230.
12	6808.7	18.3	22.	23.	45.	310.	0.8	10.6	250.
13	6809.8	8.9	46.	23.	69.	320.	0.8	11.4	260.
14	6810.4	14.3	33.	23.	56.	370.	0.5	11.9	190.
15	6811.3	4.1	32.	40.	72.	100.	1.5	13.4	150.

* Not included in cumulative feet of sand.

EARLOUGHER ENGINEERING

RESULTS OF LABORATORY FLOODING TESTS

COMPANY Lowry, et al, Operating Account LEASE Federal WELL NO. T-123

Sample No.	Depth	Porosity	Perm. Approx.	Before Flooding 1/ Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.	Max. Press. Psi.	Water Through C.C.	Time Min.	Flood Pot Residual Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.	Flood Pot Oil Recovery Bbl./A. Ft.	
F- 1	6797.3	2.9	0.1	74.	--	170.	70.	+	435.	74.	26.	170.	-0-	
F- 3	6799.7	7.7	2.0	24.	--	150.	70.	39.	435.	24.	47.	150.	-0-	
F- 5	6801.1	15.4	38.	21.	--	250.	70.	10,256.	435.	21.	78.	250.	+	
F- 7	6803.1	16.9	102.	16.	--	220.	70.	417.	435.	16.	42.	220.	-0-	
F- 9	6805.4	14.5	7.0	17.	--	200.	70.	1,176.	435.	17.	58.	200.	-0-	
F-11	6807.7	15.1	6.0	24.	--	280.	70.	30.	435.	24.	37.	280.	-0-	
F-13	6809.8	8.9	2.0	35.	--	240.	70.	668.	435.	35.	78.	240.	-0-	
F-15	6811.3	4.1	1.0	16.	--	50.	70.	476.	435.	16.	41.	50.	-0-	

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1/ Unless otherwise noted, oil content and saturation before flooding equals flood pot oil recovery plus flood pot residual.

EARLOUGHER ENGINEERING

RESULTS OF PERMEABILITY TESTS

COMPANY Lowry, et al, Operating Account WELL Federal No. T-123

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Sand		Capacity Ft. X Md.	Sample No.	Depth Feet	Permeability Millidarcys	Feet of Sand		Capacity Ft. X Md.
			Ft.	Cum. Ft.					Ft.	Cum. Ft.	
1	6797.5	IMP	0.7*			14	6804.4	76.	0.2	6.8	15.
2	6797.9	0.1	0.3	0.3	0.1	15	6805.0	495.	0.5	7.3	248.
3	6798.5	0.2	1.1	1.4	0.2	16	6805.2	17.	0.6	7.9	10.
4	6799.5	0.3	0.4	1.8	0.1	17	6805.7	0.1	0.5	8.4	0.1
5	6800.0	0.2	0.6	2.4	0.1	18	6806.4	0.1	0.4	8.8	0.1
6	6800.5	0.1	0.7	3.1	0.1	19	6807.0	101.	0.6	9.4	61.
7	6800.8	14.	0.2	3.3	2.8	21	6808.0	12.	0.7	10.1	8.4
8	6801.4	59.	0.5	3.8	30.	22	6808.4	1.1	0.3	10.4	0.3
9	6801.9	78.	0.6	4.4	47.	23	6809.1	20.	0.8	11.2	16.
10	6802.4	0.1	0.6	5.0	0.1	24	6809.6	0.1	0.4	11.6	0.1
11	6802.8	39.	0.6	5 6	23.	25	6810.1	1.6	0.5	12.1	0.8
12	6803.4	180.	0.4	6.0	72.	26	6810.7	6.2	0.5	12.6	3.1
13	6803.8	418.	0.6	6.6	251.	27	6811.1	0.1	0.8	13.4	0.1

* Not included in cumulative feet of sand.

JB

LOWRY, ET AL OPERATING ACCOUNT

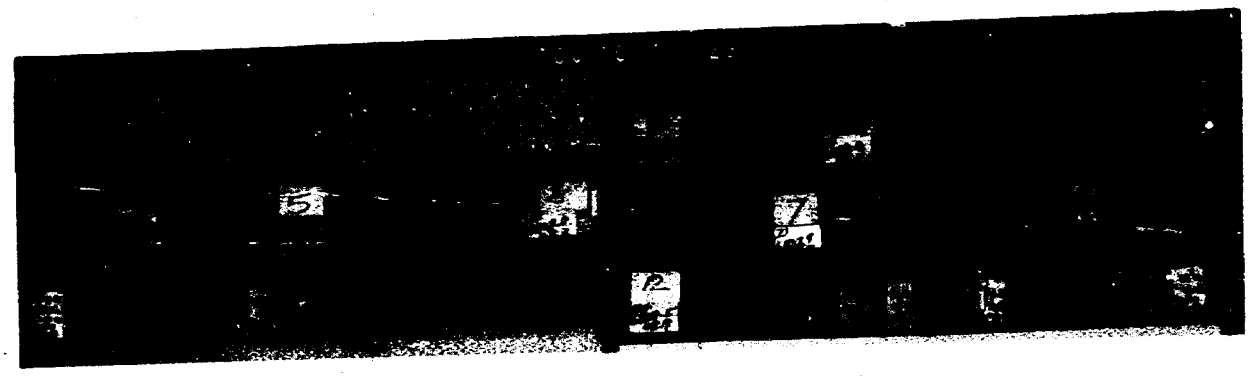
FEDERAL WELL NO. T-123

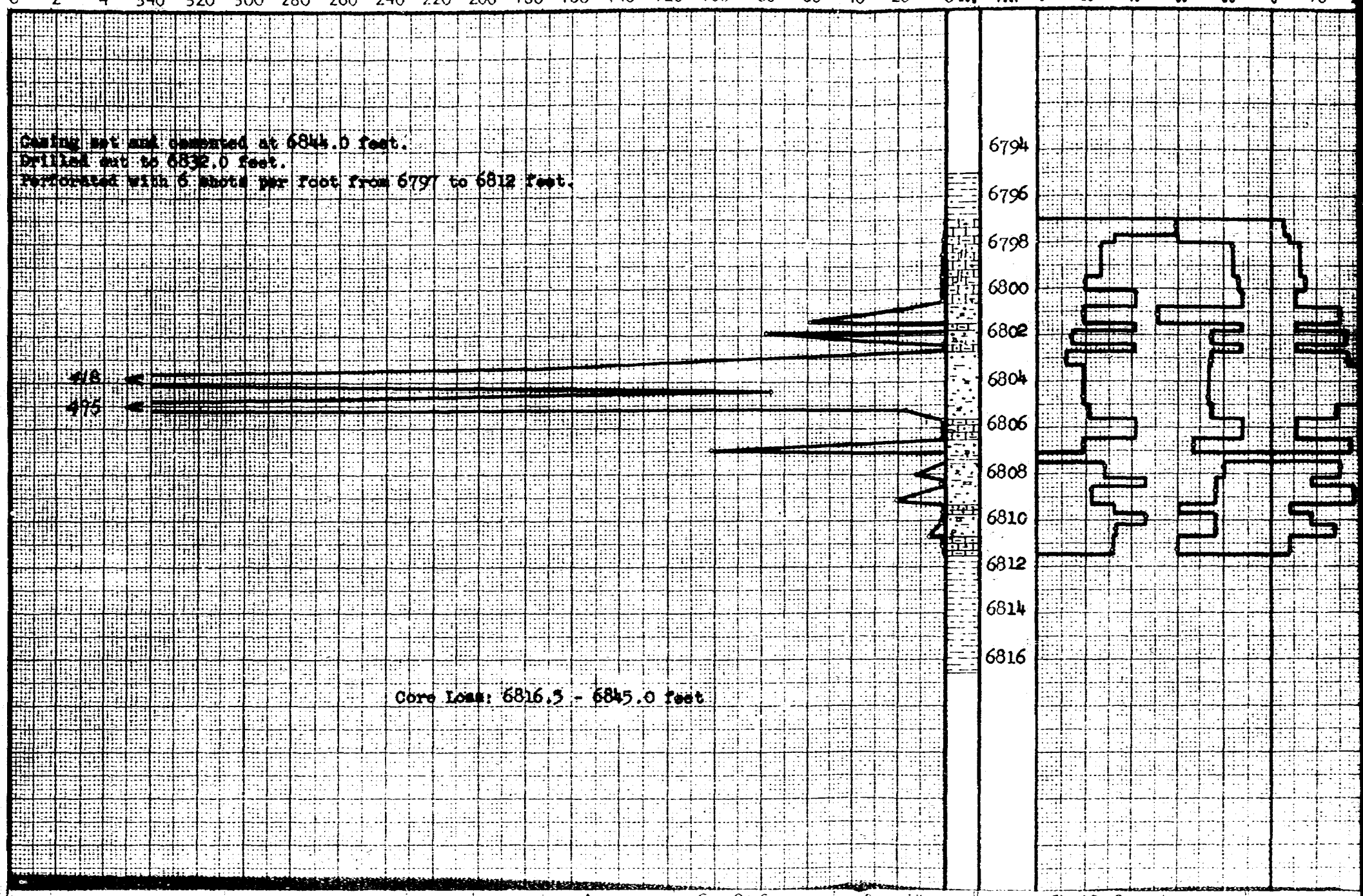
SPECIAL OIL FLOODING TESTS

Sample Number	Depth, Feet	Por. %	Perm. Approx.	Max Press Psi	Volume of Oil Thru cc	Flooding Time Mins	After Oil Flooding Oil Sat	After Oil Flooding Water Sat
OF- 6	6802.1	16.6	78.	70	24	1200	45.	19.
OF- 8	6804.7	20.6	418.	10-70	9,096	1380	81.	19.
OF-10	6806.7	17.7	101.	70	2,906	1140	85.	15.
OF-12	6808.7	18.3	20.	70	46	1260	50.	14.
OF-14	6810.4	14.3	6.2	70	638	1200	84.	16.
Average		17.5	62.				69.	17.

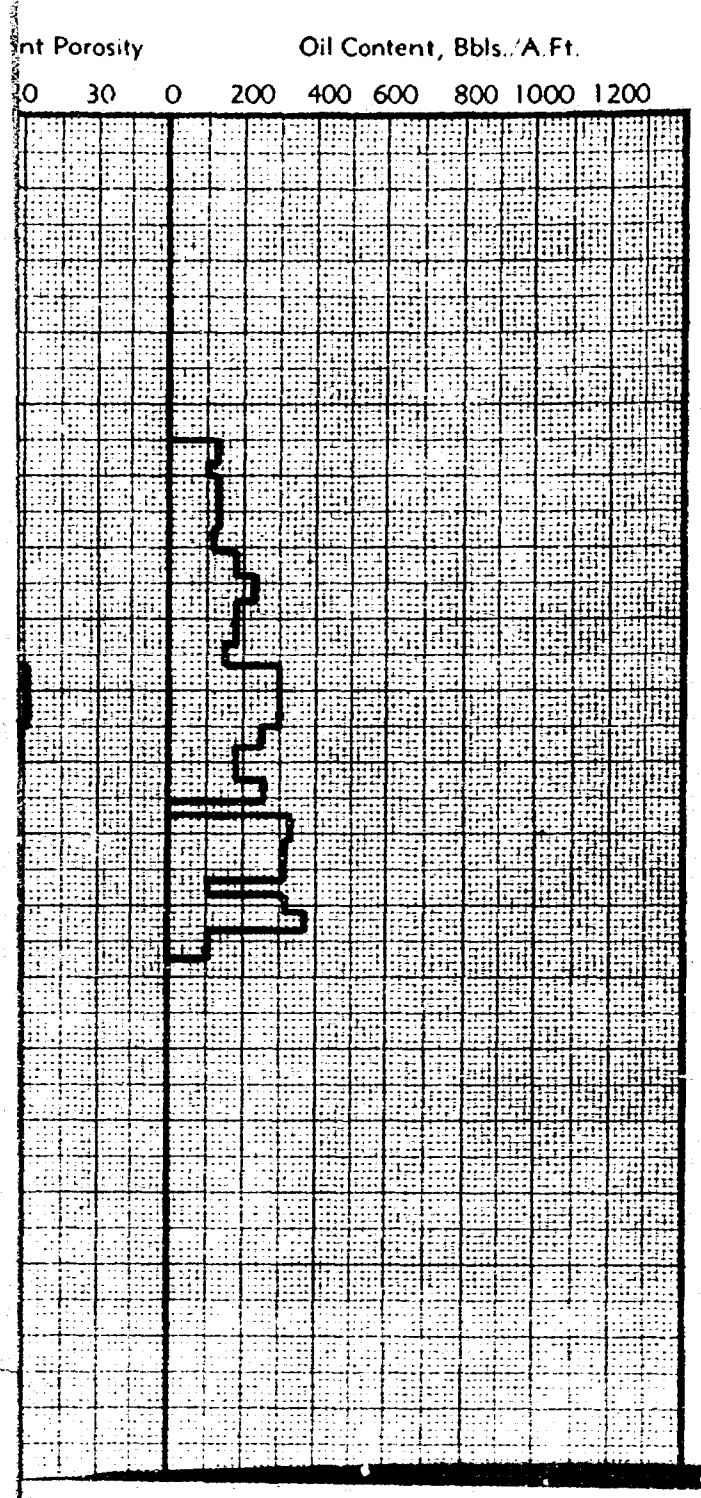
These laboratory oil flooding tests on 5 samples indicated an average residual water saturation of 17 per cent which should represent connate water.

tw





Sec.	Sand	Depth, Feet From	Depth, Feet To	Net Ft of Sand	Avg. Por.	Average Core Sat Oil	Average Core Sat Water	Core Oil Content Avg B./A Ft	Core Oil Content Total Bbl./Ac.	Permeability Avg Mds	Permeability Capacity Ft. x Md	Flood Pot Residuals Saturation Oil	Flood Pot Residuals Saturation Water	Flood Pot Residuals Oil Content B./A Ft.	Flood Pot Residuals Oil Content Bbl. Ac.
	[illegible] TO SAND														
1	0.1 - 1.0 Md	6797.7	6811.5	5.8	5.6	32.	21.	141.	820.	0.2	1.1	20.	44.	87.	500.
2	Over 1.0 Md	6800.8	6810.7	7.6	16.4	22.	27.	278.	2,110.	104.	788.	22.	58.	276.	2,100.
1&2		6797.7	6811.5	13.4	11.7	24.	24.	219.	2,930.	59.	789.	21.	52.	194.	2,600.
2A	Poss. Gas	6800.8	6803.3	1.9	16.3	15.	33.	190.	360.	54.	103.	19.	60.	240.	460.
2B	Poss. Gas-Oil	6803.3	6807.1	2.9	18.7	19.	28.	283.	820.	226.	657.	17.	58.	246.	710.
2C	Oil	6807.5	6810.7	2.8	14.1	30.	22.	332.	930.	10.	28.	30.	58.	332.	930.



MPANY LOWRY, ET AL - OPERATING ACCOUNT
SE FEDERAL WELL NO T-123
CATION 700'from N.L.,1800 from E. Line
T T 26-N R 6-W COUNTY Rio Arriba
TE New Mexico DATE 12-7-53
RLOUGHER ENGINEERING TULSA, OKLAHOMA

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE - NEW MEXICO

STATE OF NEW MEXICO TO:

All operators and parties interested in the oil pools located in San Juan, Rio Arriba, McKinley and Sandoval Counties: NOTICE AND ORDER TO SHOW CAUSE.

CASE 607:

You and each of you are hereby given notice and are hereby ordered to prepare to show cause before the Oil Conservation Commission of New Mexico at Santa Fe, New Mexico, on December 17, 1953, at 9 o'clock a.m. in Mabry Hall, State Capitol, why the following named pools in San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico, should not be classified or reclassified; extended or reduced; created or eliminated; designated or redesignated as to nomenclature and productive formations, respectively; and

Why the oil production, if any, should not be prorated and allocations fixed for the several pools under the provisions of Rule 505 of the statewide Rules and Regulations of the State of New Mexico, as follows:

Bloomfield-Farmington; Hogback-Dakota; Hospah; Lindrith-Dakota; Oswell-Farmington; South Blanco-Tocito; Rattlesnake-Dakota; Rattlesnake-Pennsylvanian; Red Mountain-Mesaverde; Stoney Butte-Dakota; Table Mesa-Dakota; Table Mesa-Mississippian; Wyper-Farmington; and pool designations for wildcat areas where substantial oil production has been encountered in any of the counties named hereinabove.

DONE at Santa Fe, New Mexico, this 27th day of November, 1953, upon motion of the Commission.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

R. R. Spurrier,
Secretary

S E A L

SOUTH BLANCO TOCITO POOL

Lowry et al Operating Account

Oil Production, Barrels

	September, 1953		October, 1953		November, 1953	
	Month	Daily Average	Month	Daily Average	Month	Daily Average
T-85	482	16	429	14	496	17
T-109	2019	67	1753	56	2142	71
T-125	0	0	2184	70	3792	126
T-127	5082	169	5690	183	4082	136
T-129	5082	169	5349	173	4082	136
T-132	2899	97	2410	78	4165	139
* T-134	0	0	0	0	0	0
T-157	4867	162	5296	171	3972	132
T-177	2860	95	2406	78	1853	62
T-179	5085	170	4405	142	4194	140
T-182	0	0	0	0	1581	53
T-207	4909	165	5332	172	3184	106
	33,285	1,110	35,254	1,137	33,543	1,118

* Converted to water injection well.
Last oil production August 1953.

IT IS T O.

(2) That the app. of the Occ upon its own motion for an order prorating the pools in the RA Sand Reef Complex is approved and pools as follows:

(1) That the following pools should be exempt from any PR as provided by from the provisions of Section B of the SW R+R.

2) That the South BT Pool shall be produced + prorated in accordance with the following Rules for a TEMPORARY PERIOD

A. All wells in the pool SHALL be PRORATED IN ACCORDANCE WITH STATEWIDE PRORATION RULES AS OUTLINED in SECTION "G" of the SW Rules & Regulations.

~~B. The pool shall have a Depth~~ proportional

B. allowables shall be calculated using a proportional factor of 2.77 and a Gas oil Ratio limit of 2000 ~~cf~~/.

C. OPERATORS SHALL TAKE GAS-OIL RATIO TESTS immediately in conformance with the provisions of Rule 506 and shall submit 3 copies of Form C-116 "Gas Oil Ratio Test" to the Commission prior to Mar 1, 1954. Allowables shall assigned wells in the pool ~~shall be~~ effective Mar 1, 1954 and in the event an operator fails to ~~com~~ comply with provisions outlined herein the well shall be

~~Straight~~ 40 BOPD TA · 2000-1 Ratio

Well allowables - South Blanco Tocito

	Well No	GOR	Productivity		allowable
Lowry	T-109	682	71		71*
	T-157	739	T		111
	T-207	2283	T	Pen.	97
	T-134	water inj well			(10)*
	T-85	1563	17		17
	T-129	733	T		111
	T-132	1306	T		111
	T-177	7252	62	Pen.	31
	T-179	1304	T		111
	T-125	1076	T		111
	T-127	789	T		111
	T-182 -	3661	53	no pen.	58
					975
Johnson	16		T	150	(111)
	11				(10)
	20		T		(111)
					232
					1165

* marginal
** Penalized by GOR
* To be Transferred to T.A. well.
(O) ESTIMATED

Under Lowry plan allowable for Lowry would be 94 bbls higher
Pool allowable 1261 bbls/day
Lowrys 1039

Case 607

(2.) That ~~Certain~~ pools in San Juan R A, San + McKinley Counties should be exempt from any prorationing ~~to~~ ~~to that [illegible] and~~ because ~~of~~ their productive capacity of each pool is ~~[illegible]~~ below the existing Market demand for crude oil from ~~each~~ pools.

Let all pools except S Blanco T.

3. That the P C of the S B T Toc pool ~~because of its high productive capacity~~ ~~for~~ exceeds Market demand and in order to prevent waste + protect correlative rights the pool should be prorated in accordance with existing Statewide Rules + Regulations with certain exceptions to compensate for the pilot program being carried on in the pool.

4. That ~~by unit~~ this Commission on Order R-326 established ~~[illegible]~~ Pool Rules for the S B T P. the Pool rules ~~[illegible]~~ 80 acre spacing program with 80 acre proration units a gas-oil ratio limit of 2000-1 and provided that in the event an allocation formula is devised that

Case 601

SOUTH BLANCO TOCITO POOL

RESERVOIR VOIDAGE ANALYSIS

Lowry et al Operating Account Properties

Average Reservoir Pressure:
1971 @ -100 datum
1986 @ -150 datum approximate reservoir centroid

Reservoir Temperature: 175° Fahrenheit

Formation Volume Factor: 1.49818 @ 1986 p.s.i.

Solution Gas: 834.36 cu. ft. @ 1986 p.s.i.

Compressibility Factor: .8450 @ 1986 p.s.i.

Volume of gas at standard condition to occupy 1 barrel of space in reservoir

$$V = \frac{1971}{15.085} \times \frac{520}{635} \times \frac{1}{.84} \times \frac{5.61}{1} = 726 \text{ cu. ft.}$$

Reservoir Voidage - November, 1953

Lowry operated properties

Average daily oil production:	1118 barrels per day
Average daily water injected:	1387 barrels per day
Producing gas-oil ratio:	1566 cu. ft. per barrel
Solution Gas Produced:	834 cu. ft. per barrel
Free Gas Produced:	732 cu. ft. per barrel

Reservoir space voidage by oil:
1118 barrels x 1.49818 = 1675 barrels

Reservoir space voidage by free gas:
1118 barrels x 732 cu. ft. = 1128 barrels

Total Gross Voidage:	2803 barrels
Daily average water injected:	1387 barrels
Net Voidage, Lowry :	1416 barrels

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. 607
Order No. R-1911

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION FOR
AN ORDER ALLOCATING THE OIL PRODUCTION
FROM ALL OIL POOLS HERETOFORE OR HERE-
AFTER CLASSIFIED, DEFINED AND DESCRIBED
IN SAN JUAN, RIO ARRIBA, SANDOVAL AND
MCKINLEY COUNTIES, NEW MEXICO, IN
ACCORDANCE WITH THE PROVISIONS OF RULE
505 OF THE OIL CONSERVATION COMMISSION'S
RULES AND REGULATIONS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on December 17, 1953, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 22nd day of March, 1961, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 subject application, pending for an undue period of time, should be dismissed.

IT IS THEREFORE ORDERED:

That Case No. 607 be and the same is hereby dismissed.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

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

esr/

DRAFT

RSM/esr
August 24

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

RSM 8/24

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

CASE No. 607
Order No. R- 1911

APPLICATION OF THE OIL CONSERVATION COMMISSION UPON ITS OWN MOTION FOR AN ORDER ALLOCATING THE OIL PRODUCTION FROM ALL OIL POOLS HERETOFORE OR HEREAFTER CLASSIFIED, DEFINED AND DESCRIBED IN SAN JUAN, RIO ARRIBA, SANDOVAL AND MCKINLEY COUNTIES, NEW MEXICO, IN ACCORDANCE WITH THE PROVISIONS OF RULE 505 OF THE OIL CONSERVATION COMMISSION'S RULES AND REGULATIONS.

3/21

3/21

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on December 17, 1953, ~~1960~~, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this _____ day of ~~August~~ March, 1960, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 subject application, pending for an undue period of time, should be dismissed.

IT IS THEREFORE ORDERED:

That Case No. 607 be and the same is hereby dismissed.

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