EARLOUGHER ENGINEERING
PETROLEUM CONSULTANTS - CORE ANALYSES
319 EAST FOURTH STREET
TULSA 3, OKLAHOMA

October 10, 1951

Belleair Oil Corporation
44 Wall Street
Room 1009
New York City 5, New York

Attention - Mr. George W. Cain

Re - Core Analysis
Barker Well No. 0-27
Sec. 4, T.27-S., R.18-E.
Neosho County, Kansas

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 f
Encl 1
cc - Lloyd Burton (2)

9-1
1-55
1166

EARLOUGHER ENGINEERING

CORE SUMMARY

Company Belleair Oil Corporation Lease Barker Well No. 0-27

Location 1,125 feet South, 500 feet West of Center

Section 4 Twp. 27-S Rge. 18-E County Neosho State Kansas

Formation Cored Bartlesville sand Type Core Rotary, 3-inch

Date Cored 9-25-51 Date Shot 9-25-51 Coring Fluid Water

Depths:

Elevation, ground	921.0 Feet
Started coring, shale	719.0 "
Depleted oil sand	722.6 - 725.7 "
Top of oil pay sand	725.7 "
Bottom of oil pay sand	753.8 "
Net feet of oil pay sand	28.0 "
Black sand	753.8 - 754.5 "
Coal	754.5 - 754.9 "
Bottom of core, shale	764.5 "
Total cored	45.5 "
Feet analyzed	31.1 "

Shot Record: Set Packer Feet

Depth, Feet From	Depth, Feet To	Feet	Shell Diameter	Quarts Per Foot	Quarts Total
731	734	3	5"	3.9	11.7
734	748	14	3"	1.5	21.0
748	752	4	4"	2.5	10.0
					42.7

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 Bartlesville section was rotary cored from 719.0 to 764.5 feet and the core sampled at the well by Earlougher Engineering. Coring was commenced and stopped in shale.

This core shows 28.0 net feet of variable oil pay sand located between depths 725.7 and 753.8 feet. Above the oil pay sand there are 2.6 net feet of depleted oil sand from 722.6 to 725.7 feet. Results of analysis are summarized in five separate sections with the depleted oil sand in Section 1 and oil pay sand in Sections 2 through 5. Section 2 has relatively low average permeability and porosity, Section 3 low average oil saturation and Section 4 high average oil content. The high average core water

(Continued following page)

saturation together with the high average total core saturation shown by this core may indicate the presence of an accidental water flood in this immediate area. The over-all oil pay sand section is comparable to that shown by core from Barker Well 0-26 to the west.

PERMEABILITY Average permeability of the oil pay sand is 220 millidarcys with Section 2 showing a low 31 millidarcys compared to average values of 318, 341 and 215 millidarcys for Section 3, 4 and 5, respectively. Individual permeability values vary considerably and range from 1.5 to 1,135 millidarcys. Permeability capacity is 6,152 foot-millidarcys. Average permeability of Section 1 is 112 millidarcys.

POROSITY Average porosity of the oil pay sand is 24.2 per cent with individual Sections 2, 3, 4 and 5 showing average values of 19.3, 28.3, 28.4 and 22.0 per cent, respectively. Individual porosity values range from 18.0 to 30.9 per cent with one low value of 14.6 per cent. Average porosity of Section 1 is 23.0 per cent.

PER CENT SATURATION The oil pay sand has an average oil saturation of 35 per cent with Section 3 showing a relatively low 26 per cent compared to average values of 40 per cent for Section 2 and 36 per cent for Sections 4 and 5. Average core water saturation is 56 per cent. Average oil saturation and average core water saturation of the depleted oil sand in Section 1 is 16 and 51 per cent, respectively.

OIL CONTENT Average oil content of the oil pay sand is 662 barrels per acre-foot with Section 4 showing a high 798 barrels per acre-foot compared to average values of 598, 566 and 620 barrels per acre-foot for Sections 2, 3 and 5, respectively. Individual oil content values range from 400 to 900 barrels per

acre-foot. Average oil content of Section 1 is 285 barrels per acre-foot.

LABORATORY FLOODING TESTS Laboratory water flooding tests indicated an average oil recovery of 368 barrels per acre-foot or a total oil recovery of 10,300 barrels per acre based on 28.0 net feet of oil pay sand. Average residual oil saturation was 16 per cent and permeability to water was high. Indicated average oil recovery from the depleted oil sand was only 35 barrels per acre-foot.

CONCLUSIONS

1. This core shows 28.0 net feet of variable oil pay sand located between depths 725.7 and 753.8 feet.

2. Average oil saturation is 35 per cent, average core water saturation 56 per cent and average permeability 220 millidarcys.

3. Total indicated flood pot oil recovery was 10,300 barrels per acre and average residual oil saturation was 16 per cent.

4. Depleted oil sand was cored from 722.6 to 725.7 feet.

5. It is believed that this immediate area has been affected by an accidental water flood.

6. Estimated oil recovery by water flooding in the field is 314 barrels per acre-foot or 8,800 barrels per acre from the area of which this core is representative.

Respectfully submitted

EARLOUGHER ENGINEERING

J M Robinson

J. M. Robinson, Engineer

EARLOUGHER ENGINEERING

SUMMARY OF CORE ANALYSES DATA

MPANY Belleair Oil Corporation LEASE Barker WELL NO. 0-27

ec.	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
	Bartlesville																
1	Deple.Oil Sd.	722.6	725.7	2.6	23.0	16.	51.	285.	740.	112.	290.	14.	84.	250.	650.	90.	100.
2	Oil Pay Sd.	725.7	733.5	7.7	19.3	40.	49.	598.	4,600.	31.	236.	15.	82.	225.	1,730.	2,870.	3,420.
3	Oil Pay Sd.	733.5	737.7	4.2	28.3	26.	64.	566.	2,380.	318.	1,337.	12.	87.	263.	1,100.	1,280.	1,370.
4	Oil Pay Sd.	737.7	746.6	8.9	28.4	36.	62.	798.	7,100.	341.	3,036.	15.	82.	331.	2,950.	4,150.	4,380.
5	Oil Pay Sd.	746.6	753.8	7.2	22.0	36.	53.	620.	4,460.	215.	1,543.	20.	80.	341.	2,460.	2,000.	2,100.
2-5	Oil Pay Sd.	725.7	753.8	28.0	24.2	35.	56.	662.	18,540.	220.	6,152.	16.	82.	294.	8,240.	10,300.	11,270.

f

EARLOUGHER ENGINEERING

RESULTS OF SATURATION TESTS

COMPANY Belleair Oil Corporation WELL Barker No. 0.27

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	720.2	14.9	19.	72.	91.	220.	0.5*		
F-2	722.7	20.8	15.	--	--	250.	0.8	0.8	200.
3	724.0	24.1	16.	51.	67.	290.	0.9	1.7	260.
F-4	725.0	23.8	17.	--	--	310.	0.9	2.6	280.
5	726.0	22.1	23.	49.	72.	400.	1.2	3.8	480.
F-6	727.3	23.1	32.	--	--	580.	0.8	4.6	460.
7	728.7	18.0	42.	58.	100.	590.	1.2	5.8	710.
F-8	729.8	18.2	54.	--	--	760.	1.2	7.0	910.
9	730.8	14.6	50.	45.	95.	560.	1.4	8.4	780.
F-10	732.1	18.8	46.	--	--	670.	0.7	9.1	470.
11	733.2	22.1	38.	51.	89.	660.	1.2	10.3	790.
F-12	734.3	27.3	27.	--	--	570.	1.6	11.9	910.
F-14	736.5	29.1	27.	--	--	620.	1.6	13.5	990.
15	737.5	28.7	22.	64.	86.	480.	1.0	14.5	480.
F-16	738.7	28.1	41.	--	--	900.	1.3	15.8	1,170.
17	739.7	30.9	32.	68.	100.	770.	1.2	17.0	920.
F-18	740.8	27.6	38.	--	--	820.	2.3	19.3	1,890.
F-20	743.5	27.8	38.	--	--	820.	1.3	20.6	1,070.
21	744.6	30.1	32.	56.	88.	740.	1.0	21.6	740.
F-24	745.5	27.5	34.	--	--	730.	1.8	23.4	1,310.
23	746.9	25.4	28.	64.	92.	540.	1.3	24.7	700.
F-22	748.2	21.5	34.	--	--	570.	0.8	25.5	460.
25	749.5	20.1	44.	47.	91.	680.	1.2	26.7	820.
F-26	750.6	22.4	44.	--	--	770.	1.3	28.0	1,000.
27	751.7	22.1	37.	58.	95.	640.	1.0	29.0	640.
F-28	752.7	19.9	34.	--	--	520.	0.9	29.9	470.
29	753.6	21.3	32.	43.	75.	530.	0.7	30.6	370.

* Not included in cumulative feet of sand.

W

EARLOUGHER ENGINEERING

RESULTS OF LABORATORY FLOODING TESTS

COMPANY Belleair Oil Corporation LEASE Barker WELL NO. 0-27

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	722.7	20.8	30.	15.	--	250.	40.	8,622.	555.	15.	90.	240.	7.	
F- 4	725.0	23.8	121.	17.	--	310.	40.	14,970.	555.	13.	77.	240.	69.	
F- 6	727.3	23.1	95.	32.	--	580.	20-40.	16,371.	675.	11.	88.	200.	381.	
F- 8	729.8	18.2	15.	54.	--	760.	40.	2,790.	495.	15.	85.	210.	554.	
F-10	732.1	18.8	40.	46.	--	670.	40.	363.	615.	19.	74.	270.	400.	
F-12	734.3	27.3	141.	27.	--	570.	20-40.	54,875.	555.	12.	87.	260.	313.	
F-14	736.5	29.1	560.	27.	--	620.	20-40.	18,818.	675.	12.	87.	280.	339.	
F-16	738.7	28.1	210.	41.	--	900.	20-40.	16,192.	615.	11.	80.	230.	670.	
F-18	740.8	27.6	175.	38.	--	820.	20-40.	12,388.	675.	15.	84.	330.	490.	
F-20	743.5	27.8	225.	38.	--	820.	20-40.	13,096.	495.	15.	80.	330.	494.	
F-24	745.5	27.5	275.	34.	--	730.	20-40.	33,207.	675.	20.	83.	420.	314.	
F-22	748.2	21.5	120.	34.	--	570.	20-40.	14,716.	495.	17.	80.	290.	279.	
F-26	750.6	22.4	140.	44.	--	770.	20-40.	26,160.	675.	20.	83.	340.	430.	
F-28	752.7	19.9	60.	34.	--	520.	20-40.	16,489.	615.	23.	81.	350.	167.	

f

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 Belleair Oil Corporation WELL Barker No. 0-27

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	720.0	1.1	0.5*			31	739.0	46.	0.4	16.2	18.
2	720.5	Imp.	0.1*			32	739.5	81.	0.4	16.6	32.
3	722.5	Imp.	0.2*			33	740.0	6.5	0.4	17.0	2.6
4	722.9	74.	0.8	0.8	59.	34	740.5	193.	0.8	17.8	154.
5	723.7	0.8	0.5*			35	741.2	140.	0.7	18.5	98.
6	724.3	148.	0.6	1.4	89.	36	741.9	957.	0.3	18.8	287.
7	724.8	123.	0.3	1.7	37.	37	742.4	224.	0.5	19.3	112.
8	725.3	117.	0.9	2.6	105.	38	743.2	85.	0.8	20.1	68.
9	725.8	25.	0.5	3.1	13.	39	743.7	403.	0.5	20.6	202.
10	726.3	40.	0.7	3.8	28.	40	744.3	1,135.	1.0	21.6	1,135.
11	727.0	59.	0.3	4.1	18.	41	744.8	320.	0.3	21.9	96.
12	727.6	138.	0.5	4.6	69.	42	745.3	387.	0.5	22.4	194.
13	728.4	12.	0.7	5.3	8.4	43	745.8	235.	1.0	23.4	235.
14	728.9	19.	0.5	5.8	9.5	44	746.7	242.	0.2	23.6	48.
15	729.5	25.	1.2	7.0	30.	45	747.2	591.	1.1	24.7	650.
16	730.1	2.5	0.4	7.4	1.0	46	748.0	49.	0.2	24.9	9.8
17	730.6	1.8	0.4	7.8	0.7	47	748.5	236.	0.6	25.5	142.
18	731.1	2.0	0.6	8.4	1.2	48	749.2	140.	0.9	26.4	126.
19	731.7	1.5	0.7	9.1	1.0	49	749.7	54.	0.3	26.7	16.
20	732.3	61.	0.5	9.6	31.	50	750.3	228.	0.6	27.3	137.
21	733.0	36.	0.7	10.3	25.	51	750.8	75.	0.7	28.0	53.
22	733.5	214.	0.3	10.6	64.	52	751.4	16.	0.3	28.3	4.8
23	734.0	148.	0.5	11.1	74.	53	751.9	255.	0.7	29.0	179.
24	734.6	138.	0.4	11.5	55.	54	752.4	79.	0.7	29.7	55.
25	735.1	322.	0.4	11.9	129.	55	752.9	45.	0.2	29.9	9.0
25A	735.6	546.	0.6	12.5	327.	56	753.5	161.	0.7	30.6	113.
26	736.2	114.	1.0	13.5	114.	57	754.0	0.6	0.4*		
27	736.7	681.	0.3	13.8	204.	58	754.4	0.1	0.3*		
28	737.1	532.	0.3	14.1	159.						
29	737.7	528.	0.4	14.5	211.						
30	738.5	309.	1.3	15.8	402.						

* Not included in cumulative feet of sand.

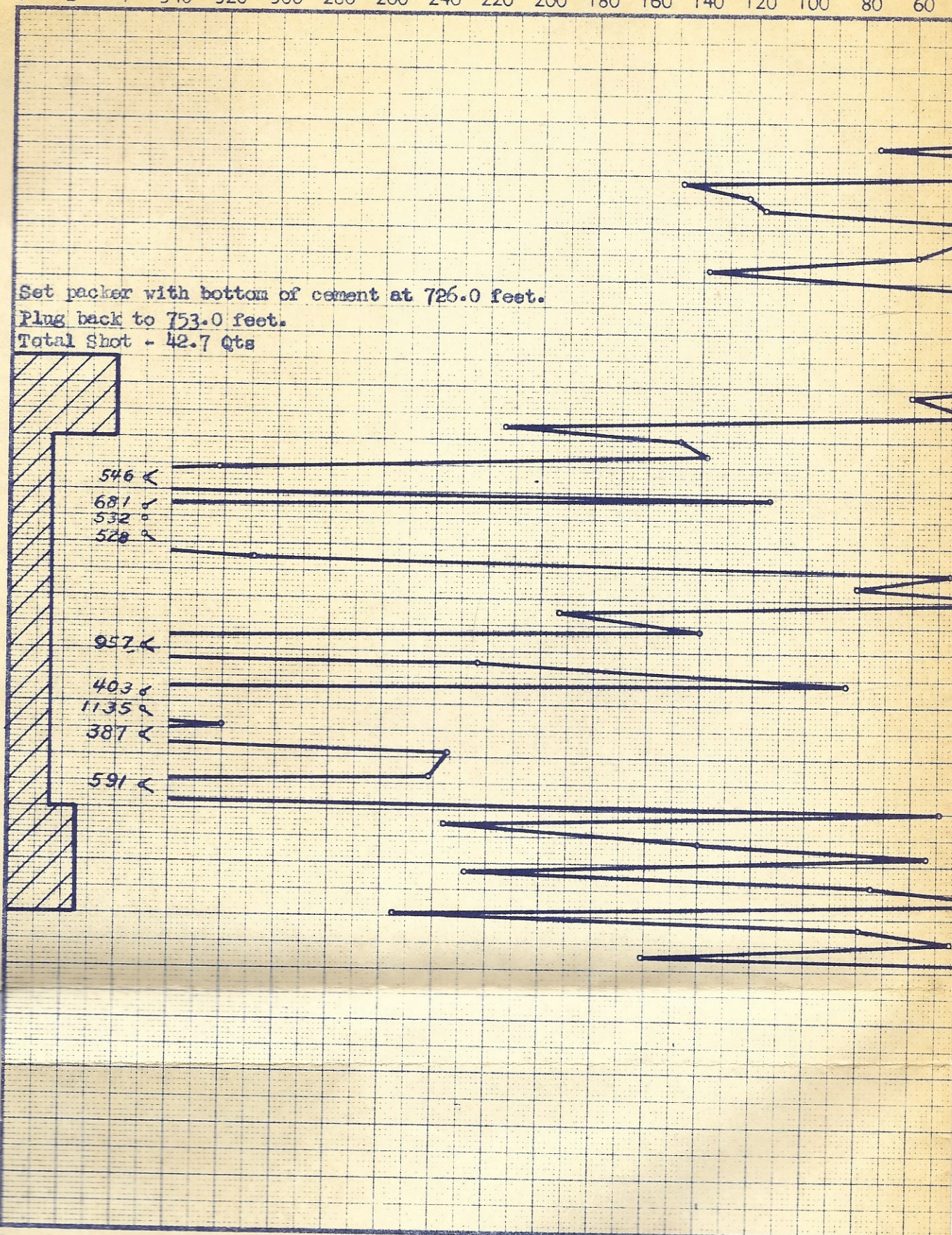
W


BARKER 0 — 27

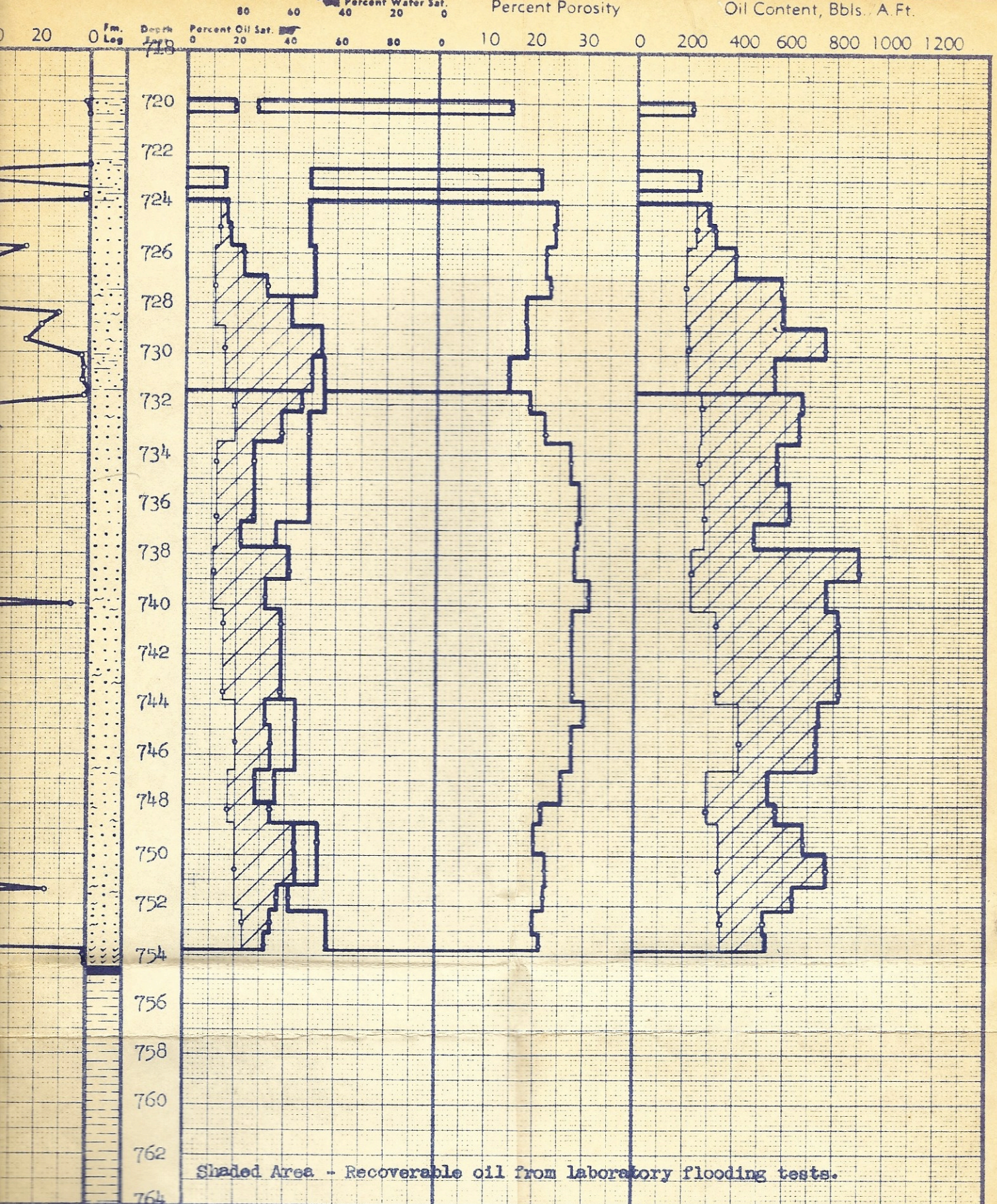
Recommended Shot, Qts./Ft.

Permeability, Millidarcys

0 2 4 340 320 300 280 260 240 220 200 180 160 140 120 100 80 60



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.
	BARTLESVILLE								
1	Depleted Oil Sd.	722.6	725.7	2.6	23.0	16.	51.	285.	740.
2	Oil Pay Sand	725.7	733.5	7.7	19.3	40.	49.	598.	4,600.
3	Oil Pay Sand	733.5	737.7	4.2	28.3	26.	64.	566.	2,380.
4	Oil Pay Sand	737.7	746.6	8.9	28.4	36.	62.	798.	7,100.
5	Oil Pay Sand	746.6	753.8	7.2	22.0	36.	53.	620.	4,460.
2-5	Oil Pay Sand	725.7	753.8	28.0	24.2	35.	56.	662.	18,540.



Shaded Area - Recoverable oil from laboratory flooding tests.

Permeability		Flood Pot Residuals			
		Saturation		Oil Content	
Capacity Ft. x Md.		Oil	Water	B./A.Ft.	Bbl./Ac.
	290.	14.	84.	250.	650.
	236.	15.	82.	225.	1,730.
	1,337.	12.	87.	263.	1,100.
	3,036.	15.	82.	331.	2,950.
	1,543.	20.	80.	341.	2,450.
	6,152.	16.	82.	294.	8,240.

COMPANY BELLEAIR OIL CORPORATION
LEASE BARKER WELL NO 0-27
LOCATION 1125'South, 500' W. of Center
SEC. 4 T 27-S R 18-E COUNTY Neosho
STATE Kansas DATE 10-10-51
EARLOUGHER ENGINEERING TULSA, OKLAHOMA