● CORE ANALYSIS ● WATER REPRESSURING ENGINEERING ● WATER ANALYSIS ● FLOODING WATER TREATMENT ● SURVEYING

OILFIELD RESEARCH LABORATORIES

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September 16, 1959

Jackson Brothers
514 North Main
Eureka, Kansas

Gentlemen:

Enclosed herewith is the report of the analysis of the 3½" Rotary core taken from the Olsen Lease, Well No. 1, Greenwood County, Kansas, and submitted to our laboratory on September 9, 1959.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. McElrea

Carl L. McElrea

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GENERAL INFORMATION & SUMMARY

Company Jackson Brothers Lease Olsen Well No. 1

Location 550' S. of N. Line & 250' E. of W Line

Section 11 Twp. 25S Rge. 8E County Greenwood State Kansas

Name of Sand	Bartlesville
Top of Core	2315.0
Bottom of Core	2334.0
Good Top of Sand	2323.5
Bottom of Sand	2328.5
Total Feet of Permeable Sand	5.9
Total Feet of Floodable Sand	-

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 2	2.3	2.3
2 - 4	2.6	4.9
4 & above	1.0	5.9

Average Permeability Millidarcys	2.4
Average Percent Porosity	15.2
Average Percent Oil Saturation	22.7
Average Percent Water Saturation	55.1
Average Oil Content, Bbls./A. Ft.	268.
Total Oil Content, Bbls./Acre	2,465.
Average Percent Oil Recovery by Laboratory Flooding Tests	
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	
Total Calculated Oil Recovery, Bbls./Acre	
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

A fresh water mud was used as the circulating fluid during the coring of the sand.

Samples were taken from the core and sealed in plastic bags by a representative of Oilfield Research Laboratories.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
2315.0 - 2318.0	Gray sandy shale (Discarded at well).
2318.0 - 2319.3	Gray shaley sandstone.
2319.3 - 2322.0	Gray and light brown shaley sandstone containing a vertical fracture.
2322.0 - 2323.5	Gray shaley sandstone containing a vertical fracture.
2323.5 - 2328.5	Light brown shaley sandstone.
2328.5 - 2329.0	Soft dark shale.
2329.0 - 2330.0	Gray sandy shale.
2330.0 - 2334.0	Dark shale (Discarded at well).

Coring was started at a depth of 2315.0 feet in gray sandy shale and completed at 2334.0 feet in dark shale. This core shows a total of 9.2 feet of sandstone. For the most part, the pay is made up of light brown shaley sandstone.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The weighted average permeability of the upper and lower sections is 0.84 and 2.7 millidarcys respectively; the overall average being 2.4 (See Table III). By observing the data given on the coregraph, it is noticeable that the sand is very tight. The permeability of the sand varies from 0.30 to a maximum of 5.5 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a low weighted average percent oil saturation, namely, 22.7. The weighted average percent oil saturation of the upper and lower sections is 22.9 and 22.4 respectively. The weighted average percent water saturation of the upper and lower sections is 60.6 and 50.6 respectively; the overall average being 55.1 (See Table III). This gives an overall weighted average total fluid saturation of 77.8 percent. This low total fluid saturation indicates considerable fluid was lost during coring, part of which probably was oil.

The weighted average oil content of the upper and lower sections is 246 and 286 barrels per acre foot respectively; the overall average being 268. The total oil content, as shown by this core, is 2,465 barrels per acre (See Table III).

LABORATORY FLOODING TESTS

The sand in this core did not respond satisfactorily to laboratory flooding tests, as all samples analyzed were found to be impermeable to water.

CONCLUSION

This core shows a thin, tight sand section which has a low oil and fairly high water saturation. It is evident that this well probably would not make a commercial producer unless it can be fractured into a better sand section. The best sand in the cored section extends from a depth of 2323.5 to 2328.5 feet.

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RESULTS OF PERMEABILITY TESTS

TABLE I

Company Jackson Brothers Lease Olsen Well No. 1

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	2319.9	Imp.	0.8	0.8	0.00
2	2320.3	Imp.	0.5	1.3	0.00
3	2320.9	Imp.	0.5	1.8	0.00
4	2321.3	1.2	0.5	2.3	0.60
5	2321.9	0.41	0.4	2.7	0.16
6	2322.3	Imp.	0.6	3.3	0.00
7	2322.9	Imp.	0.5	3.8	0.00
8	2323.3	Imp.	0.4	4.2	0.00
9	2323.9	3.2	0.6	4.8	1.92
10	2324.3	2.5	0.5	5.3	1.25
11	2324.9	2.9	0.5	5.8	1.45
12	2325.3	3.2	0.5	6.3	1.60
13	2325.9	4.1	0.5	6.8	2.05
14	2326.3	5.5	0.5	7.3	2.75
15	2326.9	3.8	0.5	7.8	1.90
16	2327.3	0.45	0.5	8.3	0.22
17	2327.9	0.30	0.5	8.8	0.15
18	2328.3	0.64	0.4	9.2	0.26

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RESULTS OF SATURATION TESTS

TABLE II

Company Jackson Brothers Lease Olsen Well No. 1

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
1	2320.1	14.5	23	57	80	259	1.3	1.3	337
2	2321.1	15.3	26	52	78	309	1.4	2.7	432
3	2322.1	11.9	23	71	94	212	0.6	3.3	127
4	2323.1	11.1	18	72	90	155	0.9	4.2	139
5	2324.1	16.6	23	48	71	296	1.1	5.3	326
6	2325.1	16.0	25	52	77	310	1.0	6.3	310
7	2326.1	15.9	22	52	74	272	1.0	7.3	272
8	2327.1	17.6	20	52	72	273	1.0	8.3	273
9	2328.1	16.2	22	49	71	277	0.9	9.2	249
							Total-	- - - - -	- 2,465

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Jackson Brothers Lease Olsen Well No. 1

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
2321.1 - 2322.0	0.9	0.84	0.76
2323.5 - 2328.5	5.0	2.7	13.55
2321.1 - 2328.5	5.9	2.4	14.31

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
2319.3 - 2323.5	4.2	13.6	22.9	60.6	246	1,035
2323.5 - 2328.5	5.0	16.5	22.4	50.6	286	1,430
2319.3 - 2328.5	9.2	15.2	22.7	55.1	268	2,465

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Jackson Brothers Lease Olsen Well No. 1

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	Effective Permeability Millidarcys**	Initial Fluid Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	2320.1	15.0	20	232	0	0	20	67	232	0	Imp.	50+
2	2321.1	14.9	25	289	0	0	25	61	289	0	Imp.	50+
3	2322.1	12.2	22	208	0	0	22	68	208	0	Imp.	50+
4	2323.1	11.5	15	134	0	0	15	81	134	0	Imp.	50+
5	2324.1	16.6	25	322	0	0	25	74	322	0	Imp.	50+
6	2325.1	16.3	23	291	0	0	23	70	291	0	Imp.	50+
7	2326.1	15.9	20	247	0	0	20	75	247	0	Imp.	50+
8	2327.1	16.9	18	236	0	0	18	73	236	0	Imp.	50+
9	2328.1	16.8	25	326	0	0	25	70	326	0	Imp.	50+

Notes: cc—cubic centimeter.

*—Volume of water recovered at the time of maximum oil recovery.

**—Determined by passing water through sample which still contains residual oil.