

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

7

More

Company Jackson Bros. Lease Harry Jackson Well No. 8

Location SE SE

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

Name of Sand - - - - - Bartlesville

Top of Core - - - - - 2410.0

Bottom of Core - - - - - 2438.0

Top of Sand - - - - - 2410.0

Bottom of Sand - - - - - 2438.0

Total Feet of Permeable Sand - - - - - 7.2

Total Feet of Floodable Sand - - - - - 1.0

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 1	3.0	3.0
1 - 2	2.0	5.0
2 & above	2.2	7.2

Average Permeability Millidarcys - - - - - 1.7

Average Percent Porosity - - - - - 10.7

Average Percent Oil Saturation - - - - - 31.2

Average Percent Water Saturation - - - - - 49.8

Average Oil Content, Bbls./A. Ft. - - - - - 264.

Total Oil Content, Bbls./Acre - - - - - 3,902.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 6.0

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 71.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 71.

Total Calculated Oil Recovery, Bbls./Acre - - (Primary) - - - - - 590.

Packer Setting, Feet - - - - -

Viscosity, Centipoises @ - - - - -

A. P. I. Gravity, degrees @ 60 °F - - - - -

Elevation, Feet - - - - -

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SUMMARY OF WATER DIFFERENTIATION TESTS

TABLE VII

Company Jackson Bros. Lease Harry Jackson Well No. 8

Depth Interval, Feet	Chloride Content of Brine in Sand, ppm	Average Percent Connate Water	Average Percent Drilling & Foreign Water
2410.0 - 2417.8	115,700		
2431.0 - 2438.0	111,500		
2410.0 - 2438.0	113,800		

Note: ppm — parts per million.

Fresh water mud was used as the circulating fluid while taking this core. The core was sampled and the samples sealed in cans by a representative of Oilfield Research Laboratories. The well was drilled in virgin territory.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
2410.0 - 2413.6	Brownish gray, shaly sandstone.
2413.6 - 2417.8	Light brown, shaly sandstone.
2417.8 - 2421.5	Dark shale.
2421.5 - 2430.0	Sandy shale.
2430.0 - 2438.0	Gray, sandy shale containing a vertical fracture.

Coring was started at a depth of 2410.0 feet in sandstone and completed at 2438.0 feet in sandy shale.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The weighted average permeability of the upper and lower sections is 1.9 and 0.35 millidarcys respectively; the overall average being 1.7 (See Table III). The permeability of the sand varies from impermeable to a maximum of 4.1 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a good weighted average percent oil saturation, namely, 31.2. The weighted average percent oil saturation of the upper and lower sections is 31.4 and 30.9 respectively. The weighted average percent water saturation of the upper and lower sections is 45.5 and 54.5 respectively; the overall average being 49.8 (See Table III). This gives an overall weighted average total fluid saturation of 81.0 percent.

In an effort to determine whether or not any flushing of the sand occurred during coring, all of the saturation samples were analyzed for chloride content. The results of these tests are given in Tables VI and VII. From the data given in these tables and on the coregraph, it is evident that very little flushing occurred during coring.

The weighted average oil content of the upper and lower sections is 302 and 222 barrels per acre foot respectively; the overall average being 264. The total oil content, as shown by this core, is 3,902 barrels per acre (See Table III).

LABORATORY FLOODING TESTS

The sand in this core responded poorly to laboratory flooding tests, as a total recovery of only 71 barrels of oil per acre was obtained from 1.0 feet of sand. The weighted average percent oil saturation was reduced from 40.0 to 34.0, or represents an average recovery of 6.0 percent.

By observing the data given in Table IV, you will note that of the 15 samples tested, 1 produced water and oil. The tests also show that the sand has practically no permeability to water.

CONCLUSION

The results of the laboratory tests indicate that water-flooding in the vicinity of this well would not be a commercial success. However primary operations should recover approximately 590 barrels of oil per acre or an average of 95 barrels per acre foot from 6.2 feet of pay sand in the zone from 2410.0 to 2417.8 feet.

This core shows a tight sand section having a good oil saturation, a moderate water saturation and somewhat low permeability.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Jackson Bros. Lease Harry Jackson Well No. 8

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	2410.1	10.1	22	63	85	173	Imp.	0.6	0.6	104	0.00
2	2411.1	8.2	26	72	98	165	0.65	1.0	1.6	165	0.65
3	2412.1	13.0	23	43	66	232	0.36	1.0	2.6	232	0.36
4	2413.1	13.2	23	44	67	236	Imp.	1.0	3.6	236	0.00
5	2414.1	13.7	42	33	75	447	1.2	1.0	4.6	447	1.20
6	2415.1	10.1	37	52	89	290	1.9	1.0	5.6	290	1.90
7	2416.1	15.5	40	28	68	482	2.7	1.0	6.6	482	2.70
8	2417.1	12.4	34	37	71	328	4.1	1.2	7.8	394	4.92
9	2431.1	7.9	29	66	95	178	Imp.	0.6	8.4	107	0.00
10	2432.1	8.8	35	62	97	239	Imp.	1.0	9.4	239	0.00
11	2433.1	9.2	35	61	96	250	Imp.	1.0	10.4	250	0.00
12	2434.1	7.4	27	48	75	155	Imp.	1.0	11.4	155	0.00
13	2435.1	7.7	27	52	79	161	0.35	1.0	12.4	161	0.35
14	2436.1	11.5	36	45	81	321	Imp.	1.0	13.4	321	0.00
15	2437.1	10.5	28	53	81	228	Imp.	1.4	14.8	319	0.00
Total									-----	3,902	

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Jackson Bros.	Lease	Harry Jackson	Well No.	8
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
2410.0 - 2417.8	6.2	1.9	11.73		
2431.0 - 2438.0	1.0	0.35	0.35		
2410.0 - 2438.0	7.2	1.7	12.08		
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Total Oil Content Bbls./Acre
2410.0 - 2417.8	7.8	12.2	31.4	45.5	2,350
2431.0 - 2438.0	7.0	9.1	30.9	54.5	1,552
2410.0 - 2438.0	14.8	10.7	31.2	49.8	3,902

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Sample No.	Depth, Feet	Relative Permeability Factors	Original Oil Saturation		Oil Recovery		Residual Saturation		Volume of Water Recovered, Cc.	Relative Permeability to Water, %	Initial Fluid Production Pressure, Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water			
1	2410.1	10.0	23	178	0	0	23	64	0	Imp.	-
2	2411.1	8.4	26	169	0	0	26	72	0	Imp.	-
3	2412.1	13.4	24	249	0	0	24	43	0	Imp.	-
4	2413.1	13.2	23	235	0	0	23	46	0	Imp.	-
5	2414.1	13.5	42	439	0	0	42	33	0	Imp.	-
6	2415.1	10.2	39	308	0	0	39	51	0	Imp.	-
7	2416.1	15.2	40	471	6	71	34	53	5	0.400	50
8	2417.1	12.6	38	371	0	0	38	37	0	Imp.	-
9	2431.1	8.1	29	182	0	0	29	65	0	Imp.	-
10	2432.1	8.6	36	240	0	0	36	63	0	Imp.	-
11	2433.1	9.5	35	258	0	0	35	63	0	Imp.	-
12	2434.1	7.2	30	168	0	0	30	47	0	Imp.	-
13	2435.1	7.8	28	170	0	0	28	53	0	Imp.	-
14	2436.1	11.7	36	326	0	0	36	47	0	Imp.	-
15	2437.1	10.5	28	228	0	0	28	55	0	Imp.	-

Jackson Bros. Harry Jackson Well No. 8

Company

Lease

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.

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RESULTS OF WATER DIFFERENTIATION TESTS
TABLE VI

Company Jackson Bros. Lease Harry Jackson Well No. 8

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation		
			Connate	Drilling & Foreign	Total
1	2410.1	124,500			
2	2411.1	105,200			
3	2412.1	97,900			
4	2413.1	107,750			
5	2414.1	119,800			
6	2415.1	115,100			
7	2416.1	138,200			
8	2417.1	119,200			
9	2431.1	95,000			
10	2432.1	104,000			
11	2433.1	111,250			
12	2434.1	152,200			
13	2435.1	133,100			
14	2436.1	99,200			
15	2437.1	88,450			

Note: ppm — parts per million