OILFIELD RESEARCH LABORATORIES

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August 11, 1960

Schermerhorn Oil Corporation
P.O. Box 287
Tulsa, Oklahoma

Gentlemen:

Enclosed herewith is the report of the analysis of the 2½" Rotary core taken from the Pavilcek-Perry Lease, Well No. W-10, Allen County, Kansas, and submitted to our laboratory on August 5, 1960.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. McElrea

Carl L. McElrea

CLM:cw

1 c. - Schermerhorn Oil Corporation
Route #1
Earlton, Kansas

Well 7-

L - 1.2

F - 2

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GENERAL INFORMATION & SUMMARY

Company Schermerhorn Oil Corporation Lease Pavilcek-Perry Well No. W-10

Location 330' East of Center

Section 34 Twp. 25S Rge. 21E County Allen State Kansas

Name of Sand	Bartlesville
Top of Core	640.5
Bottom of Core	669.5
Top of Pay Sand	652.2
Bottom of Pay Sand	661.0
Total Feet of Permeable Sand	12.8
Total Feet of Good Floodable Sand	8.8

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 25	3.2	3.2
25 - 50	2.3	5.5
50 - 75	2.3	7.8
75 - 100	1.5	9.3
100 & above	3.5	12.8

Average Permeability Millidarcys	58.9
Average Percent Porosity	18.7
Average Percent Oil Saturation	46.7
Average Percent Water Saturation	41.6
Average Oil Content, Bbls./A. Ft.	698.
Total Oil Content, Bbls./Acre	10,112.
Average Percent Oil Recovery by Laboratory Flooding Tests	29.3
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	465.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	4,555
Total Calculated Oil Recovery, Bbls./Acre	2,430.
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.

This core was sampled and the samples were sealed in cans by a representative of Oilfield Research Laboratories.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
640.5 - 646.7	Light brown shaley sandstone.
646.7 - 647.5	Laminated sandy shale.
647.5 - 650.5	Light brown shaley sandstone.
650.5 - 652.2	Laminated sandstone and shale.
652.2 - 661.0	Dark brown sandstone.
661.0 - 662.0	Brown to dark carbonaceous sandstone.
662.0 - 669.5	Shale.

Coring was started at a depth of 640.5 feet in light brown shaley sandstone and completed at 669.5 feet in shale. This core shows a total of 19.0 feet of sandstone. For the most part, the pay is made up of dark brown 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 21.4 and 70.3 millidarcys respectively; the overall average being 58.9 (See Table III). By observing the data given on the coregraph, it is noticeable that the sand has an irregular permeability profile. The permeability of the sand varies from 2.1 to a maximum of 127 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a very good weighted average percent

oil saturation, namely, 46.7. The weighted average percent oil saturation of the upper and lower sections is 28.9 and 55.4 respectively. The weighted average percent water saturation of the upper and lower sections is 64.2 and 32.2 respectively; the overall average being 41.6 (See Table III). This gives an overall weighted average total fluid saturation of 88.3 percent.

The weighted average oil content of the upper and lower sections is 372 and 854 barrels per acre foot respectively; the overall average being 698. The total oil content, as shown by this core, is 10,112 barrels per acre of which 8,364 barrels are in the lower section (See Table III).

LABORATORY FLOODING TESTS

The sand in this core responded very well to laboratory flooding tests, as a total recovery of 4,555 barrels of oil per acre was obtained from 9.8 feet of sand. The weighted average percent oil saturation was reduced from 56.4 to 27.1, or represents an average recovery of 29.3 percent. The weighted average effective permeability of the samples is 6.74 millidarcys, while the average initial fluid production pressure is 8.3 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 14 samples tested, 13 produced water and 9 oil. This indicates that approximately 64 percent of the sand represented by these samples is floodable pay sand. The tests also show that the floodable sand has a comparatively uniform effective permeability.

CONCLUSION

It is evident from the enclosed data that an efficient water-flood will recover approximately 2,430 barrels of oil per acre from the area of which this core is representative. This represents an average recovery of 276 barrels of oil per acre foot from the 8.8 feet of good

floodable pay sand analyzed. The following factors were used in calculating this recovery:

Original formation volume factor	1.06
Present formation volume factor	1.01
True water saturation, percent	32.0
Primary oil recovery, percent	4.0
Calculated present oil saturation, percent	60.8
Porosity, percent	20.7
Oil saturation at abandonment, percent	26.0
Performance factor	50.0

The analysis results show 8.8 feet of good floodable pay sand in the interval extending from the depth of 652.2 to 661.0 feet. The floodable sand has very good oil and normal water saturations and good effective permeability.

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RESULTS OF PERMEABILITY TESTS

TABLE I

Company Schermerhorn Oil Corporation Lease Pavilcek-Perry Well No. W-10

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	647.9	15.	0.6	0.6	9.00
2	648.4	9.1	0.6	1.2	5.46
3	648.9	5.7	0.5	1.7	2.85
4	649.4	45.	0.5	2.2	22.50
5	649.9	29.	0.5	2.7	14.50
6	650.4	33.	0.3	3.0	9.90
7	650.9	Imp.	0.7	3.7	0.00
8	651.4	Imp.	0.5	4.2	0.00
9	651.9	Imp.	0.5	4.7	0.00
10	652.4	16.	0.5	5.2	8.00
11	652.9	30.	0.5	5.7	15.00
12	653.4	55.	0.5	6.2	27.50
13	653.9	85.	0.5	6.7	42.50
14	654.4	124.	0.5	7.2	62.00
15	654.9	114.	0.5	7.7	57.00
16	655.4	102.	0.5	8.2	51.00
17	655.9	127.	0.5	8.7	63.50
18	656.4	31.	0.5	9.2	15.50
19	656.9	53.	0.5	9.7	26.50
20	657.4	121.	0.5	10.2	60.50
21	657.9	42.	0.5	10.7	21.00
22	658.4	101.	0.5	11.2	50.50
23	658.9	72.	0.5	11.7	36.00
24	659.4	76.	0.5	12.2	38.00
25	659.9	111.	0.5	12.7	55.50
26	660.4	75.	0.5	13.2	37.50
27	660.9	66.	0.3	13.5	19.80
28	661.4	2.1	1.0	14.5	2.10

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RESULTS OF SATURATION TESTS

TABLE II

Company Schermerhorn Oil Corporation Lease Pavilcek-Perry Well No. W-10

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.	
F-1	648.0	19.0	27	-	-	398	0.6	0.6	229
1	648.2	15.1	30	66	96	352	0.5	1.1	176
2	649.1	15.9	27	66	93	333	1.0	2.1	333
3	650.1	20.1	29	62	91	452	0.9	3.0	407
4	651.1	16.5	25	69	94	320	1.1	4.1	352
5	652.1	13.5	40	54	94	419	0.6	4.7	251
6	653.1	20.3	49	31	80	772	1.4	6.1	1,082
7	654.1	20.5	55	31	86	874	1.0	7.1	874
8	655.1	20.6	67	28	95	1,071	1.0	8.1	1,071
9	656.1	20.2	65	31	96	1,020	1.0	9.1	1,020
10	657.1	23.1	69	26	95	1,238	1.0	10.1	1,238
11	658.1	21.0	53	35	88	863	1.0	11.1	863
12	659.1	21.5	54	40	94	900	1.0	12.1	900
13	660.1	18.8	46	34	80	671	1.4	13.5	940
14	661.1	10.3	47	33	80	376	1.0	14.5	376
							Total-	- - - - -	-10,112

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Schermerhorn Oil Corporation Lease Pavilcek-Perry Well No. W-10

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
647.5 - 650.5	3.0	21.4	64.21
652.2 - 662.0	9.8	70.3	689.40
647.5 - 662.0	12.8	58.9	753.61

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
647.5 - 652.2	4.7	16.9	28.9	64.2	372	1,748
652.2 - 662.0	9.8	19.6	55.4	32.2	854	8,364
647.5 - 662.0	14.5	18.7	46.7	41.6	698	10,112

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Schermerhorn Oil Corporation Lease Pavilcek-Perry Well No. W-10

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	Effective Permeability Millidarcys**	Initial Flood Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	648.0	19.0	27	398	0	0	27	69	398	33	0.537	30
2	649.1	16.0	24	298	0	0	24	75	298	2	0.090	40
3	650.1	20.6	31	496	0	0	31	68	496	50	1.02	25
4	651.1	16.8	24	313	0	0	24	72	313	16	0.375	35
5	652.1	13.0	37	374	0	0	37	53	374	0	Imp.	50+
6	653.1	20.8	49	792	25	404	24	69	388	110	6.56	5
7	654.1	20.7	55	883	29	466	26	71	417	172	10.39	5
8	655.1	20.8	67	1,081	41	661	26	69	420	209	9.06	5
9	656.1	20.5	65	1,034	44	700	21	68	334	103	7.62	5
10	657.1	22.8	69	1,221	44	779	25	65	442	88	6.81	5
11	658.1	21.3	53	875	27	446	26	69	429	143	8.46	5
12	659.1	21.8	54	914	25	423	29	65	491	175	6.04	5
13	660.1	18.3	46	653	20	284	26	62	369	163	5.96	5
14	661.1	10.8	47	394	14	117	33	57	277	2	0.170	35

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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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Schermerhorn Oil Corporation Lease Pavilcek-Perry Well No. W-10

Depth Interval, Feet	652.2 - 662.0
Feet of Core Analyzed	9.8
Average Percent Porosity	19.7
Average Percent Original Oil Saturation	56.4
Average Percent Oil Recovery	29.3
Average Percent Residual Oil Saturation	27.1
Average Percent Residual Water Saturation	66.0
Average Percent Total Residual Fluid Saturation	93.1
Average Original Oil Content, Bbls./A. Ft.	860.
Average Oil Recovery, Bbls./A. Ft.	465.
Average Residual Oil Content, Bbls./A. Ft.	395.
Total Original Oil Content, Bbls./Acre	8,425.
Total Oil Recovery, Bbls./Acre	4,555.
Total Residual Oil Content, Bbls./Acre	3,870.
Average Effective Permeability, Millidarcys	6.74
Average Initial Fluid Production Pressure, p.s.i.	8.3

NOTE: Only those samples which recovered oil were used in calculating the above averages.