

26-30s-16E

OILFIELD RESEARCH LABORATORIES

813 EAST SIXTH
OKMULGEE, OKLAHOMA
PHONE: 1486

- REGISTERED ENGINEERS -
Chanute, Kansas

536 N. HIGHLAND
CHANUTE, KANSAS
PHONE: 728

January 7, 1959

Nicholas Sage
111 South Meramac
Clayton 5, Missouri

Dear Sir:

Enclosed herewith is the report of the analysis of the Cable Tool core taken from the Phillips Lease, Well No. 17, Wilson County, Kansas, and submitted to our laboratory on December 27, 1958.

Your business is greatly appreciated.

Yours very truly,

OILFIELD RESEARCH LABORATORIES

Carl L. McElrea
Carl L. McElrea

CLM:jh

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GENERAL INFORMATION & SUMMARY

Company	Nicholas Sage	Lease	Phillips	Well No.	17
Location	SW $\frac{1}{4}$, NE $\frac{1}{4}$, SW $\frac{1}{4}$				
Section	26	Twp	30S	Rge.	16E
		County	Wilson		State Kansas
Name of Sand					Bartlesville
Top of Core					777.5
Bottom of Core					812.4
Top of Sand					798.6
Bottom of Sand					808.5
Total Feet of Permeable Sand					5.5
Total Feet of Floodable Sand					-
Distribution of Permeable Sand:					
Permeability Range Millidarcys	Feet		Cum. Ft.		
0 - 2	2.0		2.0		
2 - 4	2.5		4.5		
4 & above	1.0		5.5		
Average Permeability Millidarcys					2.6
Average Percent Porosity					13.7
Average Percent Oil Saturation					32.0
Average Percent Water Saturation					50.1
Average Oil Content, Bbls./A. Ft.					353.
Total Oil Content, Bbls./Acre					3,496.
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					

The sand was cored in water.

This core was sampled and the samples were sealed in plastic bags by a representative of our laboratory.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval,</u>	<u>Description</u>
<u>Feet</u>	

777.5 - 782.0	- Gray sandy shale.
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782.0 - 786.6	- Sandy shale.
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786.6 - 798.4	- Dark shale.
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798.4 - 798.6	- Coal.
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798.6 - 803.0	- Gray shaley sandstone.
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803.0 - 805.0	- Brown shaley sandstone.
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805.0 - 808.5	- Brown to dark slightly carbonaceous shaley sandstone.
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808.5 - 812.4	- Gray laminated sandy shale.
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Coring was started at a depth of 777.5 feet in gray sandy shale and completed at 812.4 feet in gray laminated sandy shale. This core shows a total of 9.9 feet of sandstone. For the most part, the pay is made up of shaley sandstone.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The sand in the upper section is impermeable, while the weighted average permeability of the lower section is 2.6 millidarcys (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 0.87 to a maximum of 7.0 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a fairly good weighted average percent oil saturation, namely, 32.0. The weighted average percent oil saturation of the upper and lower sections is 25.1 and 37.6 respectively. The weighted average percent water saturation of the upper and lower sections is 59.0 and 42.5 respectively; the overall average being 50.1 (See Table III). This gives an overall weighted average total fluid saturation of 82.1 percent.

The weighted average oil content of the upper and lower sections is 241 and 442 barrels per acre foot respectively; the overall average being 353. The total oil content, as shown by this core, is 3,496 barrels per acre (See Table III).

LABORATORY FLOODING TESTS

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

CONCLUSION

This core shows a thin tight sand section having a fairly good oil saturation. The sand in this core did not respond satisfactorily to laboratory flooding tests as all samples tested were impermeable to water.

Hydraulic fracturing the sand in this well may fracture into a thicker and more permeable sand section and make a commercial producer.

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RESULTS OF PERMEABILITY TESTS
TABLE I

Company Nicholas Sage Lease Phillips Well No. 17

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	798.8	Imp.	0.5	0.5	0.00
2	799.3	Imp.	0.5	1.0	0.00
3	799.8	Imp.	0.5	1.5	0.00
4	800.3	Imp.	0.5	2.0	0.00
5	800.8	Imp.	0.5	2.5	0.00
6	801.3	Imp.	0.7	3.2	0.00
7	802.3	Imp.	0.7	3.9	0.00
8	802.8	Imp.	0.5	4.4	0.00
9	803.3	0.99	0.6	5.0	0.59
10	803.8	1.6	0.5	5.5	0.80
11	804.3	2.5	0.5	6.0	1.25
12	804.8	3.5	0.4	6.4	1.40
13	805.3	3.1	0.6	7.0	1.86
14	805.8	2.1	0.5	7.5	1.05
15	806.3	7.0	0.5	8.0	3.50
16	806.8	4.3	0.5	8.5	2.15
17	807.3	2.2	0.5	9.0	1.10
18	807.8	0.87	0.5	9.5	0.43
19	808.3	1.1	0.4	9.9	0.44

RESULTS OF SATURATION TESTS

TABLE II

Company			Nicholas Sage		Lease		Phillips		Well No.		17	
Sst. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation		Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre				
			Oil	Water		Ft.	Cum. Ft.					
1	799.1	9.0	17	70	119	1.0	1.0	119				
2	800.1	10.0	27	53	210	1.0	2.0	210				
3	801.1	13.6	30	57	317	1.0	3.0	317				
4	802.1	14.6	26	57	295	1.4	4.4	413				
5	803.1	16.8	30	43	391	0.6	5.0	235				
6	804.1	20.2	37	31	580	1.4	6.4	812				
7	805.1	12.9	47	42	471	0.6	7.0	283				
8	806.1	11.6	31	60	279	0.7	7.7	195				
F-8-A	806.5	16.1	33	-	412	0.3	8.0	124				
9	807.1	14.4	41	41	459	1.0	9.0	459				
10	808.1	11.8	40	48	366	0.9	9.9	329				
						Total	- - - -	3,496				
Note: "A" Sample was taken from core after it was received in the laboratory.												

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Nicholas Sage	Lease	Phillips	Well No.	17
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
798.6 - 803.0	0.0	Imp.	0.00		
803.0 - 808.5	5.5	2.6	14.57		
798.6 - 808.5	5.5	2.6	14.57		
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Total Oil Content Bbls./Acre
798.6 - 803.0	4.4	12.1	25.1	59.0	1,059
803.0 - 808.5	5.5	15.1	37.6	42.5	2,437
798.6 - 808.5	9.9	13.7	32.0	50.1	3,496

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company			Nicholas Sage			Lease			Phillips			Well No.			17		
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	799.1	9.4	14	102	0	0	14	65	102	0	Imp.	50+					
2	800.1	9.8	26	198	0	0	26	50	198	0	Imp.	50+					
3	801.1	13.2	30	308	0	0	30	64	308	0	Imp.	50+					
4	802.1	14.7	23	262	0	0	23	62	262	0	Imp.	50+					
5	803.1	16.6	28	361	0	0	28	51	361	0	Imp.	50+					
6	804.1	20.1	34	530	0	0	34	45	530	0	Imp.	50+					
7	805.1	13.3	46	475	0	0	46	35	475	0	Imp.	50+					
8-A	806.5	16.1	33	412	0	0	33	35	412	0	Imp.	50+					
9	807.5	14.2	39	430	0	0	39	44	430	0	Imp.	50+					
Note: "A" Sample was taken from core after it was received in the laboratory.																	

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.