OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND · CHANUTE, KANSAS 66720 · PHONE (316) 431-2650

September 26, 1979

Oaks Petroleum, Inc.
R.R. #2
Stoystown, Pennsylvania 15563

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the East Miller Lease, Well No. O-49, Franklin County, Kansas, and submitted to our laboratory on September 20, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman

Benjamin R. Pearman

SAM:cgb

3 c to Stoystown, Pennsylvania
1 c to Ottawa, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Oaks Petroleum, Inc. Lease East Miller Well No. 0-49

Location

Section 10 Twp. 17S Rge. 21E County Franklin State Kansas

Name of Sand	Squirrel
Top of Core	600.0
Bottom of Core	608.3
Top of Sand (Tested)	600.9
Bottom of Sand	608.3
Total Feet of Permeable Sand	6.5
Total Feet of Floodable Sand	5.8

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	1.7	1.7
10 - 20	2.1	3.8
30 - 40	2.7	6.5

Average Permeability Millidarcys	21.7
Average Percent Porosity	20.2
Average Percent Oil Saturation	42.3
Average Percent Water Saturation	37.6
Average Oil Content, Bbls./A. Ft.	677.
Total Oil Content, Bbls./Acre	4,400.
Average Percent Oil Recovery by Laboratory Flooding Tests	19.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	316.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,834.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid. The core was reported to be from a virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
600.0 - 600.3	Brown shaly sandstone.
600.3 - 600.9	Gray sandy shale.
600.9 - 601.6	Brown shaly sandstone.
601.6 - 602.3	Gray conglomeratic calcareous shaly sandstone.
602.3 - 602.8	Brown and gray laminated sandstone and shale.
602.8 - 605.0	Brown sandstone.
605.0 - 605.2	Gray conglomeratic calcareous shaly sandstone.
605.2 - 607.3	Brown sandstone.
607.3 - 608.3	Brown and gray laminated sandstone and shale.
608.3 - 617.0	Loss.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,834 barrels of oil per acre was obtained from 5.8 feet of sand. The weighted average percent oil saturation was reduced from 44.1 to 25.1, or represents an average recovery of 19.0 percent. The weighted

average effective permeability of the samples is 2.74 millidarcys, while the average initial fluid production pressure is 21.7 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 7 samples tested, 6 produced water and oil. This indicates that approximately 86 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 2,420 barrels of oil per acre. This is an average recovery of 418 barrels per acre foot from 5.8 feet of floodable sand analyzed in this core.

These recovery values were calculated using the following data and assumptions:

Original formation volume factor	1.04
Reservoir water saturation, percent	20.0
Average porosity, percent	20.8
Oil saturation after flooding, percent	25.1
Performance factor, percent	50.0
Net floodable pay sand, feet	5.8

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Oaks Petroleum, Inc. **Lease** East Miller **Well No.** O-49

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	601.3	16.9	27	60	87	354	1.6	0.7	0.7	248	1.12
2	602.5	22.1	44	28	72	754	35.	0.5	1.2	377	17.50
3	603.5	22.4	49	27	76	852	35.	1.2	2.4	1022	42.00
4	604.5	20.8	51	25	76	823	38.	1.0	3.4	823	38.00
5	605.5	22.4	47	28	75	817	17.	0.8	4.2	654	13.60
6	606.5	20.5	45	36	81	716	20.	1.3	5.5	931	26.00
7	607.5	15.9	28	62	90	345	3.1	1.0	6.5	345	3.10

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Oaks Petroleum, Inc. Lease East Miller Well No. O-49

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
600.9 - 608.3	6.5	21.7	141.32

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
600.9 - 608.3	6.5	20.2	42.3	37.6	677	4,400

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Oaks Petroleum, Inc. Lease East Miller Well No. O-49

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	601.3	17.0	27	356	0	0	27	70	356	0	Imp.	-
2	602.5	22.2	44	758	17	293	27	70	465	70	1.90	20
3	603.5	22.4	49	852	26	452	23	74	400	157	4.60	20
4	604.5	20.8	51	823	26	420	25	72	403	54	1.70	20
5	605.5	22.6	47	824	17	298	30	68	526	318	7.80	20
6	606.5	21.0	45	733	20	326	25	71	407	38	1.00	20
7	607.5	16.3	28	354	5	63	23	73	291	2	0.20	30

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.

Oilfield Research Laboratories

SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Oaks Petroleum, Inc. Lease East Miller Well No. O-49

Depth Interval, Feet	600.9 - 608.3
Feet of Core Analyzed	5.8
Average Percent Porosity	20.8
Average Percent Original Oil Saturation	44.1
Average Percent Oil Recovery	19.0
Average Percent Residual Oil Saturation	25.1
Average Percent Residual Water Saturation	71.6
Average Percent Total Residual Fluid Saturation	96.7
Average Original Oil Content, Bbls./A. Ft.	722.
Average Oil Recovery, Bbls./A. Ft.	316.
Average Residual Oil Content, Bbls./A. Ft.	406.
Total Original Oil Content, Bbls./Acre	4,190.
Total Oil Recovery, Bbls./Acre	1,834.
Total Residual Oil Content, Bbls./Acre	2,356.
Average Effective Permeability, Millidarcys	2.74
Average Initial Fluid Production Pressure, p.s.i.	21.7

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