

OILFIELD RESEARCH LABORATORIES

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

November 1, 1982

Oaks Petroleum, Inc.
c/o Calvin T. Oaks Jr.
Rural Route #2
Stoystown, Pennsylvania 15563

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Miller-Graves Lease, Well No. 079, located in Franklin County, Kansas, and submitted to our laboratory on October 26, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/pdc

2 c to Stoystown, PA
3 c to Paola, Kansas

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Oaks Petroleum, Inc. Lease Miller-Graves Well No. 079

Location _____

Section 15 Twp. 17S Rge. 21E County Franklin State Kansas

Elevation, Feet

Name of Sand..... First Squirrel

Top of Core 605.0

Bottom of Core 616.4

Top of Sand 605.0

Bottom of Sand 615.0

Total Feet of Permeable Sand 5.5

Total Feet of Floodable Sand 5.2

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 6	2.5	2.5
13 - 30	1.2	3.7
60 - 110	1.8	5.5

Average Permeability Millidarcys 38.6

Average Percent Porosity 18.6

Average Percent Oil Saturation 40.3

Average Percent Water Saturation 47.2

Average Oil Content, Bbls./A. Ft. 578.

Total Oil Content, Bbls./Acre 3177.

Average Percent Oil Recovery by Laboratory Flooding Tests 10.7

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. 154.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre 803.

Total Calculated Oil Recovery, Bbls./Acre See "Calculated Recovery"
Section

-2-

The core was sampled and the samples sealed in plastic bags by a representative of the client. Salt water mud was used as a drilling fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
605.0 - 606.0	Grayish brown very shaly sandstone.
606.0 - 607.4	Brown sandstone.
607.4 - 608.0	Alternate layers of gray shale and brown sandstone.
608.0 - 608.7	Brown sandstone.
608.7 - 610.0	Gray shale.
610.0 - 610.4	Brown sandstone.
610.4 - 610.6	Gray shale.
610.6 - 611.5	Brown sandstone.
611.5 - 612.7	Alternate layers of gray shale and brown sandstone.
612.7 - 614.7	Gray slightly sandy shale.
614.7 - 615.0	Brown shaly sandstone.
615.0 - 616.4	Gray sandy shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 803 barrels of oil per acre was obtained from 5.2 feet of sand. The weighted average percent oil saturation was reduced from 40.8 to 30.1 or represents an average recovery of 10.7 percent. The weighted average effective permeability of the samples is 2.63 millidarcys, while the average initial fluid production pressure is 29.2 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 core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 1,550 barrels of oil per acre. This is an average recovery of 298 barrels per acre foot from 5.2 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	25.0
Average porosity, percent	18.6
Oil saturation after flooding, percent	30.1
Performance factor, percent, estimated	50.0
Net floodable sand, feet	5.2

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Oaks Petroleum, Inc. Lease Miller-Graves Well No. 079

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbbs. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	605.4	16.6	40	50	90	515	0.78	1.0	1.0	515	0.78
2	606.5	18.8	39	56	95	569	110.	1.4	2.4	797	154.00
3	608.6	22.2	38	34	72	654	27.	0.7	3.1	458	18.90
4	610.7	23.2	43	29	72	774	60.	0.4	3.5	310	24.00
5	611.4	20.3	37	41	78	583	13.	0.5	4.0	292	6.50
6	612.5	15.5	46	50	96	553	6.0	1.2	5.2	664	7.20
7	614.8	19.5	31	51	82	469	3.3	0.3	5.5	141	0.99

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Oaks Petroleum, Inc.	Lease	Miller-Graves	Well No.	079		
	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.			
	605.0 - 615.0	5.5	38.6	212.37			
	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
605.0 - 615.0	5.5	18.6	40.3	47.2	578	3177	

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company			Oaks Petroleum, Inc.			Lease			Miller-Graves			Well No.			079		
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	605.4	16.7	40	518	7	91	33	60	427	8	0.10	45					
2	606.5	18.9	39	572	11	161	28	68	411	346	8.55	20					
3	608.6	22.1	38	652	12	206	26	68	446	40	0.60	20					
4	610.7	23.1	43	771	13	233	30	60	538	10	0.15	30					
5	611.4	20.2	37	580	6	94	31	61	486	20	0.30	35					
6	612.5	15.6	46	557	14	169	32	65	388	50	0.82	25					
7	614.8	19.0	32	472	0	0	32	50	472	0	Imp.	-					

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

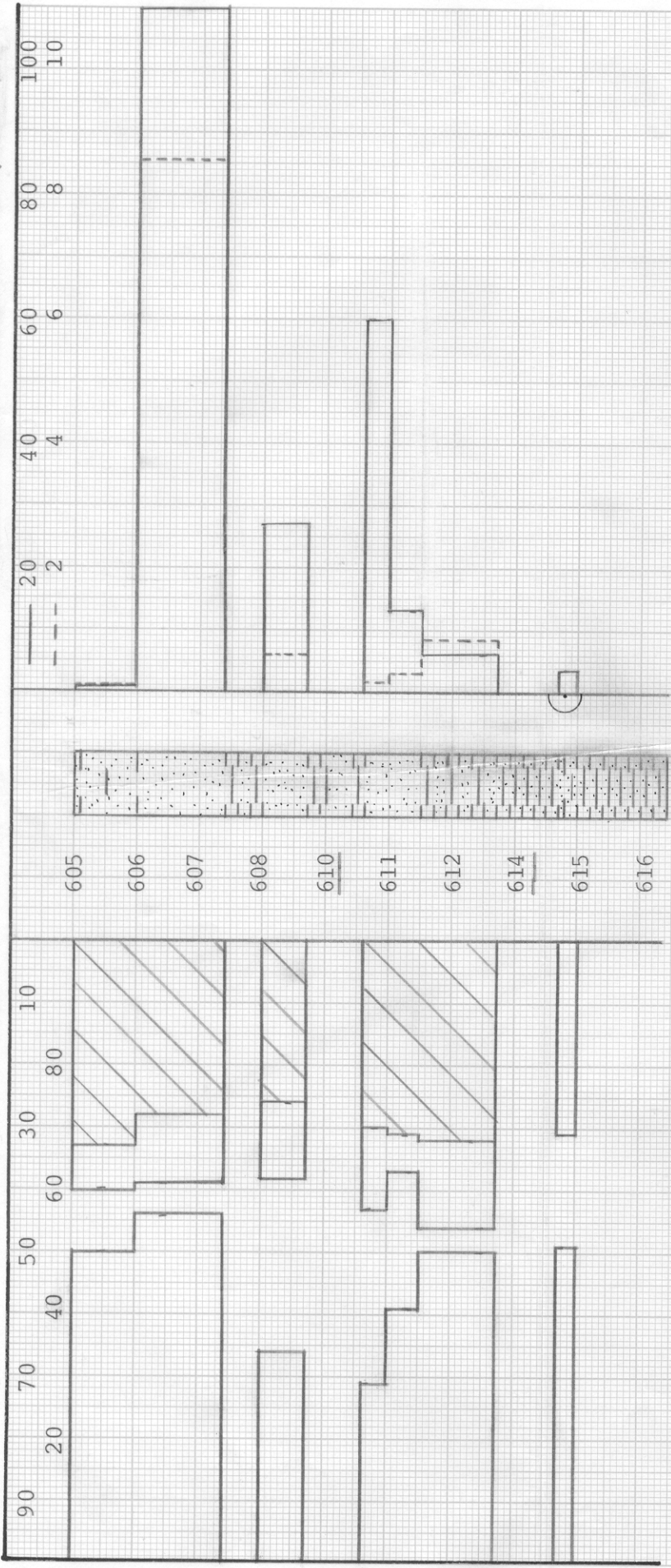
TABLE V

Company	Oaks Petroleum, Inc	Lease	Miller-Graves	Well No.	079
Depth Interval, Feet	605.0 - 615.0				
Feet of Core Analyzed	5.2				
Average Percent Porosity	18.6				
Average Percent Original Oil Saturation	40.8				
Average Percent Oil Recovery	10.7				
Average Percent Residual Oil Saturation	30.1				
Average Percent Residual Water Saturation	64.5				
Average Percent Total Residual Fluid Saturation	94.6				
Average Original Oil Content, Bbls./A. Ft.	584.				
Average Oil Recovery, Bbls./A. Ft.	154.				
Average Residual Oil Content, Bbls./A. Ft.	430.				
Total Original Oil Content, Bbls./Acre	3041.				
Total Oil Recovery, Bbls./Acre	803.				
Total Residual Oil Content, Bbls./Acre	2238.				
Average Effective Permeability, Millidarcys	2.63				
Average Initial Fluid Production Pressure, p.s.i.	29.2				

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

WATER SAT., PERCENT → ← OIL SAT., PERCENT

— PERMEABILITY, IN MILLIDARCYS
 --- EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS



KEY:



SHALE



SANDSTONE



IMPERMEABLE TO WATER

SHALY SANDSTONE

SANDY SHALE

SHALE WITH SANDSTONE PARTINGS

FLOODPOT RESIDUAL OIL SATURATION

OAKS PETROLEUM, INC.

MILLER - GRAVES LEASE

FRANKLIN COUNTY, KANSAS

WELL NO. 079

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY PERCENT	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBL'S. / ACRE
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IMPERMEABLE TO WATER



FLOODPOT RESIDUAL OIL SATURATION

OAKS PETROLEUM, INC.

MILLER - GRAVES LEASE

WELL NO. 079

FRANKLIN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLs. / ACRE
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605.0 - 615.0

5.5

18.6

40.3

47.2

38.6

1550

(PRIMARY AND
WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANTUE, KANSAS
NOVEMBER, 1982
PDC