OILFIELD RESEARCH LABORATORIES
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June 21, 1979

Oaks Petroleum, Inc.
Rt. 2
Stoystown, Pennsylvania 15563

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the South Freeman Lease, Well No. LO-10, Franklin County, Kansas, and submitted to our laboratory on June 15, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman

Benjamin R. Pearman

SAM:km
3 c to Stoystown, Pennsylvania
1 c to Ottawa, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Oaks Petroleum, Inc. Lease South Freeman Well No. LO-10

Location 1,210' NSL & 1,455' WEL SW¼

Section 15 Twp. 17S Rge. 22E County Franklin State Kansas

Name of Sand	Peru
Top of Core	513.0
Bottom of Core	527.0
Top of Sand	513.0
Bottom of Sand	526.0
Total Feet of Permeable Sand	5.9
Total Feet of Floodable Sand	4.7

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	1.7	1.7
10 - 50	3.0	4.7
50 - 60	1.2	5.9

Average Permeability Millidarcys	22.5
Average Percent Porosity	19.4
Average Percent Oil Saturation	34.2
Average Percent Water Saturation	47.9
Average Oil Content, Bbls./A. Ft.	530.
Total Oil Content, Bbls./Acre	3,497.
Average Percent Oil Recovery by Laboratory Flooding Tests	8.6
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	135.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	635.
Total Calculated Oil Recovery, Bbls./Acre (Primary & Waterflooding)	1,540.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

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

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
513.0 - 514.5	Brown sandstone.
514.5 - 515.5	Gray sandy shale.
515.5 - 518.7	Brown sandstone.
518.7 - 519.3	Gray sandy shale.
519.3 - 519.8	Brown very shaly sandstone.
519.8 - 520.2	Gray calcareous sandy shale.
520.2 - 520.9	Light brown very shaly sandstone.
520.9 - 525.3	Gray sandy shale.
525.3 - 526.0	Light brown slightly shaly sandstone.
526.0 - 527.0	Gray sandy shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 635 barrels of oil per acre was obtained from 4.7 feet of sand. The weighted average percent oil saturation was reduced from 39.8 to 31.2, or represents an average recovery of 8.6 percent. The weighted average effective permeability of the samples is 0.57 millidarcys, while the average initial fluid production pressure is 25.8 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 9 samples tested, 7 produced water and 6 oil. This indicates that approximately 67 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

From a study of the data, it would appear that efficient primary and waterflood operations in the vicinity of this well should recover approximately 1,540 barrels of oil per acre. This is an average recovery of 327 barrels per acre foot from 4.7 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	25.0
Average porosity, percent	20.6
Oil saturation after flooding, percent	31.2
Performance factor, percent	50.0
Net floodable pay sand, feet	4.7

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Oaks Petroleum, Inc. **Lease** South Freeman **Well No.** LO-10

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	513.4	21.9	43	37	80	731	16.	1.0	1.0	731	16.00
2	514.3	22.9	42	30	72	746	54.	0.5	1.5	373	27.00
3	515.7	22.7	31	38	69	546	8.2	0.5	2.0	273	4.10
4	516.5	19.3	35	46	81	524	14.	1.0	3.0	524	14.00
5	517.5	18.1	49	42	91	688	30.	1.0	4.0	688	30.00
6	518.5	20.8	34	41	75	549	51.	0.7	4.7	384	35.70
7	519.6	19.6	40	46	86	608	0.49	0.5	5.2	304	0.25
8	520.7	13.7	11	83	94	117	Imp.	0.7	5.9	82	0.00
9	525.5	16.9	15	68	83	197	7.9	0.7	6.6	138	5.53

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Oaks Petroleum, Inc. Lease South Freeman Well No. LO-10

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
513.0 - 518.7	4.7	27.0	126.80
519.3 - 526.0	1.2	4.8	5.78
513.0 - 526.0	5.9	22.5	132.58

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
513.0 - 518.7	4.7	20.6	39.9	39.9	633	2,973
519.3 - 526.0	1.9	16.4	20.1	67.7	276	524
513.0 - 526.0	6.6	19.4	34.2	47.9	530	3,497

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Oaks Petroleum, Inc. Lease South Freeman Well No. LO-10

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	513.4	21.4	43	714	11	182	32	55	532	5	0.50	25
2	514.3	22.8	42	743	9	159	33	65	583	58	2.20	20
3	515.7	22.3	31	536	3	52	28	68	484	28	0.78	20
4	516.5	19.4	35	527	5	75	30	61	452	5	0.20	30
5	517.5	18.6	49	707	15	216	34	59	491	5	0.20	30
6	518.5	21.0	34	554	5	81	29	60	473	4	0.40	30
7	519.6	19.6	40	608	0	0	40	53	608	0	Imp.	-
8	520.7	13.9	12	130	0	0	12	82	130	0	Imp.	-
9	525.5	17.0	17	224	0	0	17	73	224	3	0.30	40

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 South Freeman Well No. LO-10

Depth Interval, Feet	513.0 - 518.7
Feet of Core Analyzed	4.7
Average Percent Porosity	20.6
Average Percent Original Oil Saturation	39.8
Average Percent Oil Recovery	8.6
Average Percent Residual Oil Saturation	31.2
Average Percent Residual Water Saturation	60.3
Average Percent Total Residual Fluid Saturation	91.5
Average Original Oil Content, Bbls./A. Ft.	633.
Average Oil Recovery, Bbls./A. Ft.	135.
Average Residual Oil Content, Bbls./A. Ft.	498.
Total Original Oil Content, Bbls./Acre	2,975.
Total Oil Recovery, Bbls./Acre	635.
Total Residual Oil Content, Bbls./Acre	2,340.
Average Effective Permeability, Millidarcys	0.57
Average Initial Fluid Production Pressure, p.s.i.	25.8

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