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

August 21, 1979

Lincoln 77
8485 Kathy Lane
Lincoln, Nebraska 68526

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Wright Lease, Well No. 5, Coffey County, Kansas, and submitted to our laboratory on August 15, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman

Benjamin R. Pearman

BRP:cgb

4 c to Lincoln, Nebraska
1 c to Topeka, Kansas

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GENERAL INFORMATION & SUMMARY

Company Lincoln 77 Lease Wright Well No. 5

Location 620' SNL & 300' WEL SE SE NE

Section 21 Twp. 22S Rge. 16E County Coffey State Kansas

Name of Sand	Lower Squirrel
Top of Core	1015.0
Bottom of Core	1020.5
Top of Sand	1015.2
Bottom of Sand	1020.5
Total Feet of Permeable Sand	3.4
Total Feet of Floodable Sand	1.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	1.9	1.9
26 - 62	1.5	3.4

Average Permeability Millidarcys	22.8
Average Percent Porosity	16.0
Average Percent Oil Saturation	49.9
Average Percent Water Saturation	38.8
Average Oil Content, Bbls./A. Ft.	630.
Total Oil Content, Bbls./Acre	2,775.
Average Percent Oil Recovery by Laboratory Flooding Tests	5.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	67.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	67.
Total Calculated Oil Recovery, Bbls./Acre (Primary & Waterflooding)	134.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

Fresh water mud was used as the circulating fluid while taking this core. The well was drilled in non-virgin territory. The core was sampled and the samples sealed in bags by a representative of the client.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
1015.0 - 1015.2	Hard gray calcareous shaly sandstone.
1015.2 - 1017.9	Dark brown and gray laminated sandstone and shale.
1017.9 - 1018.8	Gray sandy shale.
1018.8 - 1020.3	Dark brown sandstone.
1020.3 - 1020.5	Dark brown and gray laminated sandstone and shale.

LABORATORY FLOODING TESTS

A portion of the sand in this core responded to laboratory flooding tests, as a total recovery of 67 barrels of oil per acre was obtained from 1.0 feet of sand. The weighted average percent oil saturation was reduced from 54.0 to 49.0, or represents an average recovery of 5.0 percent. The weighted average effective permeability of the samples is 8.50 millidarcys, while the average initial fluid production pressure is 20.0 pounds per square inch (See Table V).

CONCLUSION

Based on the results of the laboratory testing, it appears that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 134 barrels of oil per acre.

The following data and assumptions were used in calculating the above recovery value:

Original formation volume factor	1.05
Reservoir water saturation, percent	25.0
Average porosity, percent	17.2
Oil saturation after flooding, percent	49.0
Performance factor, percent	45.0
Net floodable pay sand, feet	1.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Lincoln 77 Lease Wright Well No. 5

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	1015.4	13.3	35	59	94	361	0.48	0.7	0.7	252	0.34
2	1016.4	16.8	66	29	95	860	0.38	1.0	1.7	860	0.38
3	1017.7	13.7	39	50	89	415	Imp.	1.0	2.7	415	0.00
4	1018.9	19.2	51	30	81	760	26.	0.5	3.2	380	13.00
5	1019.6	17.1	54	30	84	716	62.	1.0	4.2	716	62.00
6	1020.4	19.2	51	27	78	760	9.4	0.2	4.4	152	1.88

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Lincoln 77 Lease Wright Well No. 5

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
1015.2 - 1020.5	3.4	22.8	77.60

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
1015.2 - 1020.5	4.4	16.0	49.9	38.8	630	2,775

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Lincoln 77 Lease Wright Well No. 5

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	1015.4	13.6	34	359	0	0	34	61	359	1	0.08	50
2	1016.4	16.7	66	855	0	0	66	30	855	0	Imp.	–
3	1017.7	14.0	38	413	0	0	38	52	413	0	Imp.	–
4	1018.9	19.0	51	752	0	0	51	42	752	70	1.43	25
5	1019.6	17.2	54	721	5	67	49	46	654	325	8.50	20
6	1020.4	19.0	51	752	0	0	51	40	752	4	0.23	50

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 Lincoln 77 Lease Wright Well No. 5

Depth Interval, Feet	1015.2 - 1020.5
Feet of Core Analyzed	1.0
Average Percent Porosity	17.2
Average Percent Original Oil Saturation	54.0
Average Percent Oil Recovery	5.0
Average Percent Residual Oil Saturation	49.0
Average Percent Residual Water Saturation	46.0
Average Percent Total Residual Fluid Saturation	95.0
Average Original Oil Content, Bbls./A. Ft.	721.
Average Oil Recovery, Bbls./A. Ft.	67.
Average Residual Oil Content, Bbls./A. Ft.	654.
Total Original Oil Content, Bbls./Acre	721.
Total Oil Recovery, Bbls./Acre	67.
Total Residual Oil Content, Bbls./Acre	654.
Average Effective Permeability, Millidarcys	8.50
Average Initial Fluid Production Pressure, p.s.i.	20.0

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