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

October 10, 1980

Pineridge Development Corporation
14150 Elderberry Road
Golden, Colorado 80401

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core samples taken from the Markley Lease, Well No. 7, located in Linn County, Kansas and submitted to our laboratory on September 8, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/ks

5 c to Golden, Colorado

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GENERAL INFORMATION & SUMMARY

Company Pineridge Development Corporation Lease Markley Well No. 7

Location -

Section 1 Twp. 22S Rge. 23E County Linn State Kansas

Elevation, Feet	-
Name of Sand	Upper Bartlesville
Top of Core	341.0
Bottom of Core	351.0
Top of Sand	341.0
Bottom of Sand	351.0
Total Feet of Permeable Sand (Tested)	8.0
Total Feet of Floodable Sand	6.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	1.0	1.0
20 - 50	3.0	4.0
50 - 100	1.0	5.0
100 - 200	2.0	7.0
200 - 300	1.0	8.0

Average Permeability Millidarcys	82.9
Average Percent Porosity	20.4
Average Percent Oil Saturation	47.2
Average Percent Water Saturation	32.6
Average Oil Content, Bbls./A. Ft.	758.
Total Oil Content, Bbls./Acre	7584.
Average Percent Oil Recovery by Laboratory Flooding Tests	10.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	157.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	942.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section

The core was sampled and the samples sealed in plastic bags by a representative of the client. Fresh water mud was used as a drilling fluid. The core was reported to be from a virgin area.

As the client delivered samples only to the laboratory, it is assumed that each sample represents one foot of core.

FORMATION CORED

Depth Interval, Feet	Description
341.0 - 343.0	Brown shaly slightly calcareous sandstone.
343.0 - 347.0	Brown slightly calcareous sandstone.
347.0 - 351.0	Dark brown slightly calcareous sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 941 barrels of oil per acre was obtained from 6.0 feet of sand. The weighted average percent oil saturation was reduced from 44.8 to 34.8, or represents an average recovery of 10.0 percent. The weighted average effective permeability of the samples is 4.96 millidarcys, while the average initial fluid production pressure is 31.7 pounds per square inch(See Table V).

By observing the data given in Table IV, you will note that of the 10 samples tested, 6 produced water and oil, and 2 samples produced water only. This indicates that approximately 60 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 2150 barrels of oil per acre. This is an average recovery of 359 barrels per acre foot from 6.0 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.03
Reservoir water saturation, percent, estimated	20.0
Average porosity, percent	19.6
Oil saturation after flooding, percent	34.8
Performance factor, percent, estimated	55.0
Net floodable pay sand, feet	6.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Pineridge Development Corporation Lease Markley Well No. 7

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	341.5	15.2	39	46	85	460	*	1.0	1.0	460	*
2	342.5	19.9	40	30	70	618	3.9	1.0	2.0	618	3.90
3	343.5	19.5	47	32	79	711	*	1.0	3.0	711	*
4	344.5	21.0	39	38	77	635	34.	1.0	4.0	635	34.00
5	345.5	21.6	49	24	73	821	77.	1.0	5.0	821	77.00
6	346.5	14.6	43	50	93	487	20.	1.0	6.0	487	20.00
7	347.5	20.5	51	30	81	811	226.	1.0	7.0	811	226.00
8	348.5	24.7	46	20	66	882	125.	1.0	8.0	882	125.00
9	349.5	24.6	58	18	76	1107	28.	1.0	9.0	1107	28.00
10	350.5	22.6	60	38	98	1052	149.	1.0	10.0	1052	149.00

NOTE: * Permeability sample unobtainable.

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Pineridge Development Corporation Lease Markley Well No. 7

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
341.0 - 351.0	8.0	82.9	662.90

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
341.0 - 351.0	10.0	20.4	47.2	32.6	758	7,584

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company: Pineridge Development Corporation — Lease: Markley — Well No.: 7

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	341.5	15.7	38	463	0	0	38	49	463	0	Imp.	-
2	342.5	19.8	40	614	5	77	35	60	537	8	0.08	50
3	343.5	19.7	47	718	11	168	36	56	550	98	2.02	25
4	344.5	21.0	39	635	9	147	30	66	488	53	0.97	30
5	345.5	21.6	49	821	16	268	33	62	553	229	10.99	20
6	346.5	14.7	43	490	5	57	38	57	433	18	0.22	40
7	347.5	20.6	51	815	14	224	37	60	591	326	15.49	25
8	348.5	24.8	46	885	0	0	46	40	885	272	5.70	45
9	349.5	24.1	59	1103	0	0	59	20	1103	0	Imp.	-
10	350.5	22.5	60	1047	0	0	60	38	1047	9	0.22	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 Pineridge Development Corporation Lease Markley Well No. 7

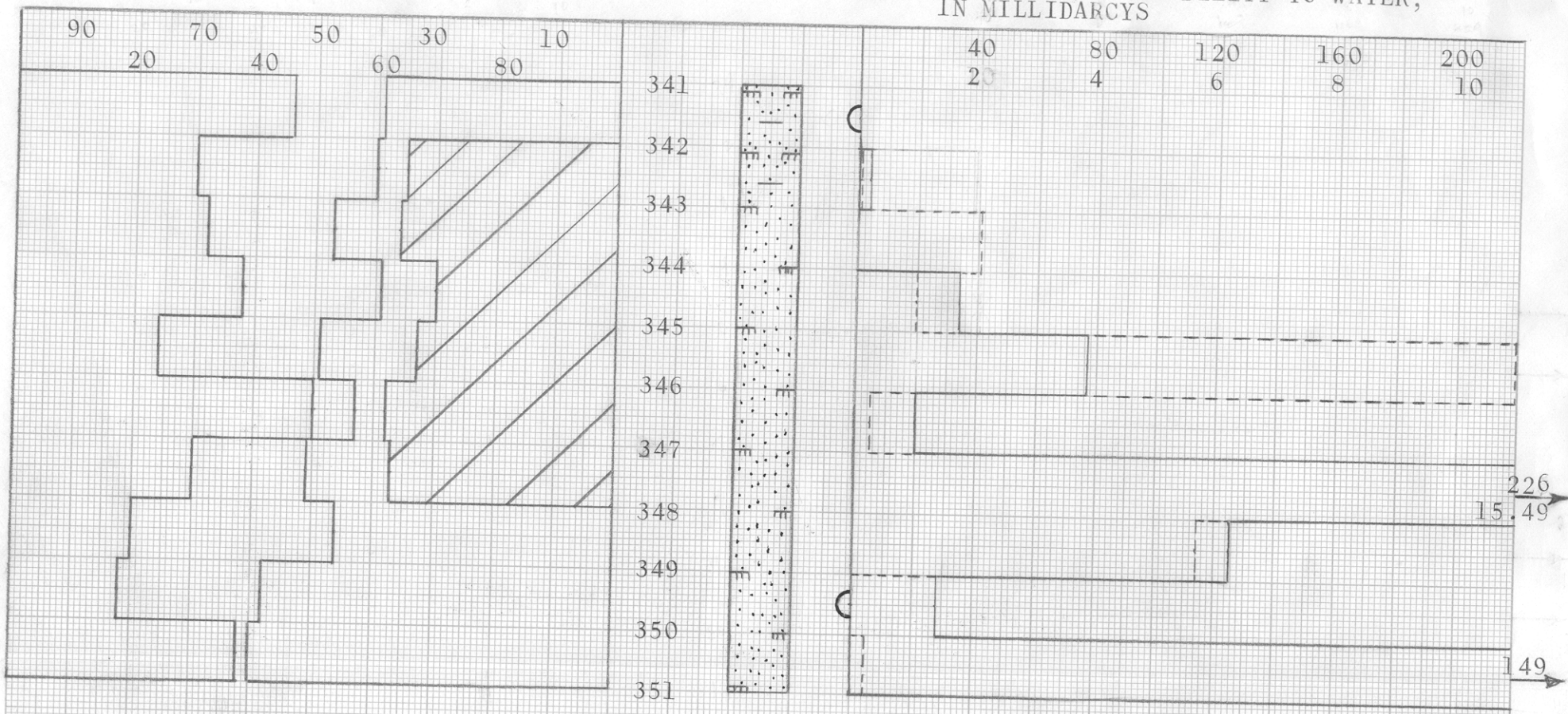
Depth Interval, Feet	341.0 - 351.0
Feet of Core Analyzed	6.0
Average Percent Porosity	19.6
Average Percent Original Oil Saturation	44.8
Average Percent Oil Recovery	10.0
Average Percent Residual Oil Saturation	34.8
Average Percent Residual Water Saturation	60.2
Average Percent Total Residual Fluid Saturation	95.0
Average Original Oil Content, Bbls./A. Ft.	682.
Average Oil Recovery, Bbls./A. Ft.	157.
Average Residual Oil Content, Bbls./A. Ft.	525.
Total Original Oil Content, Bbls./Acre	4093.
Total Oil Recovery, Bbls./Acre	941.
Total Residual Oil Content, Bbls./Acre	3152.
Average Effective Permeability, Millidarcys	4.96
Average Initial Fluid Production Pressure, p.s.i.	31.7

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:

SHALY CALCAREOUS SANDSTONE

CALCAREOUS SANDSTONE

FLOODPOT RESIDUAL OIL SATURATION

IMPERMEABLE TO WATER

PINERIDGE DEVELOPMENT CORP.

MARKLEY LEASE WELL NO. 7

LINN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY PERCENT	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY MILLIDARCYS	CALCULATED OIL RECOVERY BBLS./ACRE
341.0 - 351.0	10.0	20.4	47.2	32.6	82.9	2,150 (PRIMARY &