

OILFIELD RESEARCH LABORATORIES

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

March 4, 1981

Lamco Energy, Inc.
P. O. Box 776
Chanute, Kansas 66720

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary cores taken from the Stan Stitt Lease, Well No. C-34, located in Neosho County, Kansas and submitted to our laboratory on January 14, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

4 c to Chanute, Kansas
1 c to Tulsa, Oklahoma

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Lamco Energy, Inc. Lease Stan Stitt Well No. C-34

Location _____

Section 25 Twp. 29S Rge. 17E County Neosho State Kansas

Elevation, Feet - - - - -

Name of Sand	Bartlesville	Lower Bartlesville
Top of Core	904.0	981.0
Bottom of Core	943.2	999.7
Top of Sand	904.0	981.0
Bottom of Sand	(Tested) 928.0	998.6
Total Feet of Permeable Sand	15.0	16.7
Total Feet of Floodable Sand		10.3

Distribution of Permeable Sand:
Permeability Range
Millidarcys

	Feet	Cum. Ft.
	<u>BARTLESVILLE SAND</u>	
0 - 2	4.2	4.2
2 - 4	5.7	9.9
4 - 6	1.9	11.8
6 & Above	3.2	15.0
	<u>LOWER BARTLESVILLE SAND</u>	
35 - 85	4.5	4.5
135 - 190	4.0	8.5
285 - 300	2.2	10.7
395 - 650	4.0	14.7
825 & Above	2.0	16.7

Average Permeability Millidarcys	6.6	341.1
Average Percent Porosity	14.3	19.2
Average Percent Oil Saturation	27.1	28.9
Average Percent Water Saturation	48.4	51.9
Average Oil Content, Bbls./A. Ft.	300.	438.
Total Oil Content, Bbls./Acre	4,795.	7,700.
Average Percent Oil Recovery by Laboratory Flooding Tests		3.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.		45.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre		467.
Total Calculated Oil Recovery, Bbls./Acre		467.

See "Cal. Rec."
Section

The core was sampled by a representative of Oilfield Research Laboratories. Salt water mud was used as a drilling fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval,</u> <u>Feet</u>	<u>Description</u>
<u>BARTLESVILLE SAND</u>	
904.0 - 905.8	Grayish light brown shaly sandstone.
905.8 - 907.1	Light brown sandstone.
907.1 - 913.7	Light brown and gray laminated sandstone and shale.
913.7 - 914.6	Light brown sandstone.
914.6 - 917.0	Light brown and gray laminated sandstone and shale.
917.0 - 920.5	Gray laminated sandstone and shale.
920.5 - 922.5	Light brown and gray laminated sandstone and shale.
922.5 - 926.6	Gray laminated sandstone and shale.
926.6 - 927.0	Light brown and gray laminated sandstone and shale.
927.0 - 928.0	Brown shaly sandstone.
928.0 - 943.2	Gray laminated sandstone and shale.

LOWER BARTLESVILLE SAND

981.0 - 983.2	Brown sandstone.
983.2 - 984.3	Brown and gray laminated sandstone and shale.
984.3 - 985.2	Light brown shaly sandstone.
985.2 - 998.6	Light brown sandstone.
998.6 - 999.2	Gray sandy shale.
999.2 - 999.7	Gray shaly sandstone.

LABORATORY FLOODING TESTS

LOWER BARTLESVILLE SAND

At the request of the client, only the Lower Bartlesville sand was subjected to flooding susceptibility tests. The Lower Bartlesville sand in this core responded to laboratory flooding tests, as a total recovery of 467 barrels of oil per acre was obtained from 10.3 feet of sand. The weighted average percent oil saturation was reduced from 35.1 to 32.1, or represents an average recovery of 3.0 percent. The weighted average effective permeability of the samples is 13.78 millidarcys, while the average initial fluid production pressure is 14.5 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 18 samples tested, 10 produced water and oil, and 6 samples produced water only. This indicates that approximately 56 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERYLOWER BARTLESVILLE SAND

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 2,240 barrels of oil per acre. This is an average recovery of 217 barrels per acre foot from 10.3 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.08
Reservoir water saturation, percent, estimated	35.0
Average porosity, percent	19.9
Oil saturation after flooding, percent	32.1
Performance factor, percent, estimated	50.0
Net floodable sand, feet	10.3

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Lamco Energy, Inc.

Lease Stan Stitt

Well No. C-34

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.		
						<u>BARTLESVILLE SAND</u>					
1	904.5	17.8	16	38	54	221	6.1	1.0	221	6.10	
2	905.5	14.3	32	59	92	355	3.5	0.8	284	2.80	
3	906.5	16.4	29	49	78	369	32.	1.3	480	41.60	
4	907.4	14.6	32	49	81	363	5.8	0.9	327	5.22	
5	908.6	13.2	22	43	65	225	3.5	1.0	225	3.50	
6	909.6	13.6	14	51	65	148	Imp.	1.0	148	0.00	
7	910.4	13.4	27	48	75	281	0.71	1.8	506	1.28	
8	913.4	14.0	21	65	86	228	0.92	1.9	433	1.75	
9	914.5	15.0	20	39	59	233	22.	0.9	210	19.80	
10	915.5	14.2	34	36	70	375	3.0	1.4	525	4.20	
11	916.6	13.8	27	36	63	289	4.5	1.0	289	4.50	
12	920.7	14.1	25	61	86	274	0.28	0.5	137	0.14	
13	921.5	12.9	43	34	77	430	3.6	1.0	430	3.60	
14	922.2	8.5	31	62	93	204	2.4	0.5	102	1.20	
15	927.5	16.2	38	60	98	478	2.8	1.0	478	2.80	
						<u>LOWER BARTLESVILLE SAND</u>					
16	981.5	21.0	39	42	81	635	399.	1.0	635	399.00	
17	982.5	20.2	29	44	73	455	296.	1.2	546	355.20	
18	983.6	16.3	37	56	93	468	36.	1.1	515	39.60	
19	984.7	11.3	26	69	95	228	Imp.	0.9	205	0.00	
20	985.5	18.9	19	68	87	279	68.	0.8	223	54.40	
21	986.6	19.6	19	57	76	289	137.	1.0	289	137.00	
22	987.6	21.2	26	54	80	428	415.	1.0	428	415.00	
23	988.6	22.4	37	48	85	643	288.	1.0	643	288.00	
24	989.6	21.7	11	64	75	185	637.	1.0	185	637.00	

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

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Lamco Energy, Inc.

Lease Stan Stitt

Well No. C-34

Company

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			Ft.	Cum. Ft.		
25	990.5	22.0	36	21	614	826.	1.0	10.0	614	826.00
26	991.5	19.6	32	60	487	624.	1.0	11.0	487	624.00
27	992.5	18.9	35	48	513	179.	1.0	12.0	513	179.00
28	993.5	20.2	32	47	502	1223.	1.0	13.0	502	1223.00
29	994.5	19.2	36	39	536	68.	1.0	14.0	536	68.00
30	995.7	19.0	39	44	575	78.	1.0	15.0	575	78.00
31	996.7	19.0	30	50	442	188.	1.0	16.0	442	188.00
32	997.5	21.0	21	55	342	137.	1.0	17.0	342	137.00
33	998.5	10.9	4	90	34	80.	0.6	17.6	20	48.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lamco Energy, Inc.	Lease	Stan Stitt	Well No.	C-34
	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	
			<u>BARTLESVILLE SAND</u>		
	904.0 - 928.0	15.0	6.6	98.49	
			<u>LOWER BARTLESVILLE SAND</u>		
	981.0 - 990.0	8.1	287.1	2,325.20	
	990.0 - 998.6	8.6	392.0	3,371.00	
	981.0 - 998.6	16.7	341.1	5,696.20	
			<u>BARTLESVILLE SAND</u>		
	904.0 - 928.0	14.3	27.1	300	4,795
			<u>LOWER BARTLESVILLE SAND</u>		
	981.0 - 990.0	19.3	27.3	408	3,669
	990.0 - 998.6	19.2	30.6	469	4,031
	981.0 - 998.6	19.2	28.9	438	7,700

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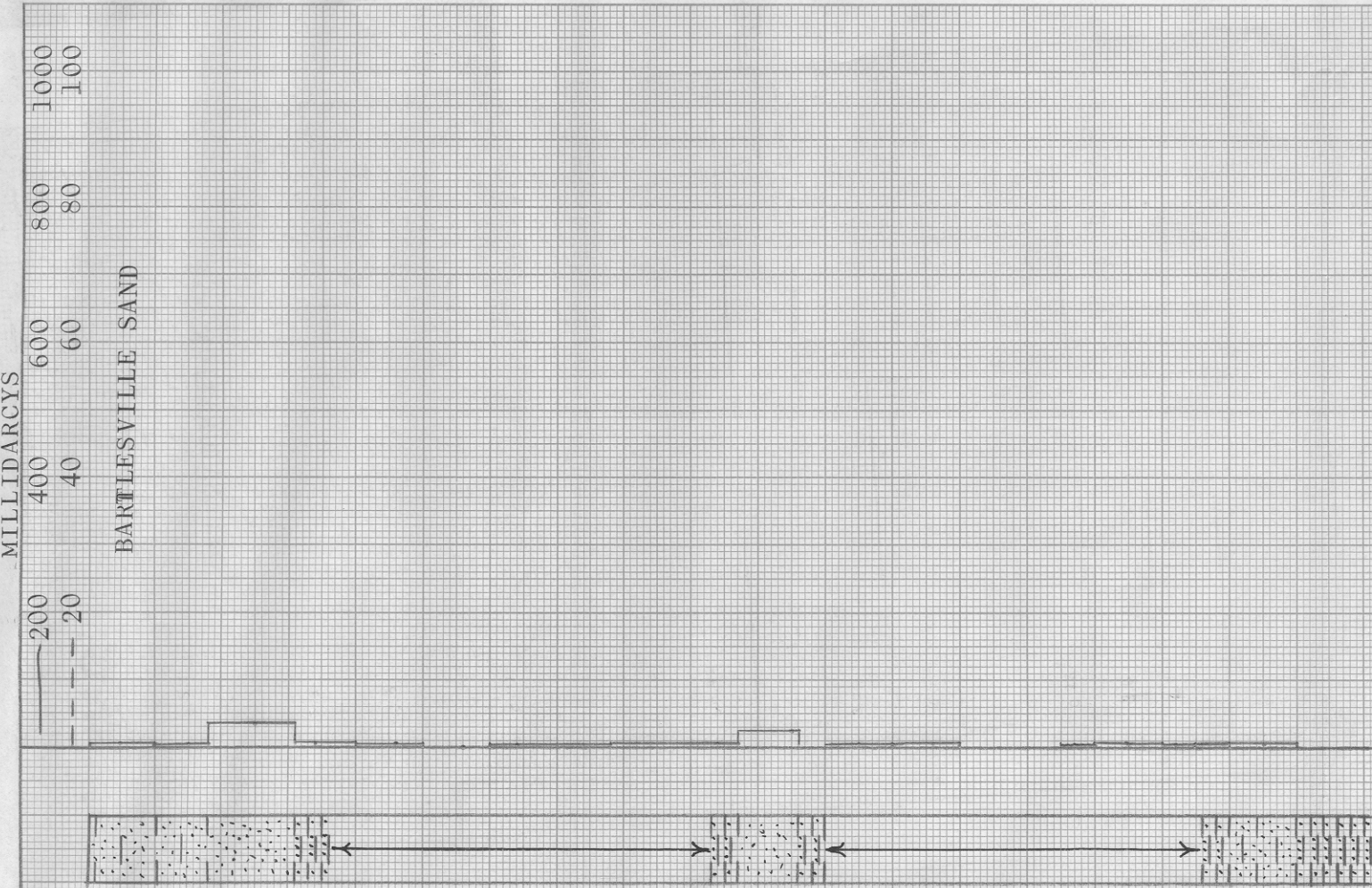
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

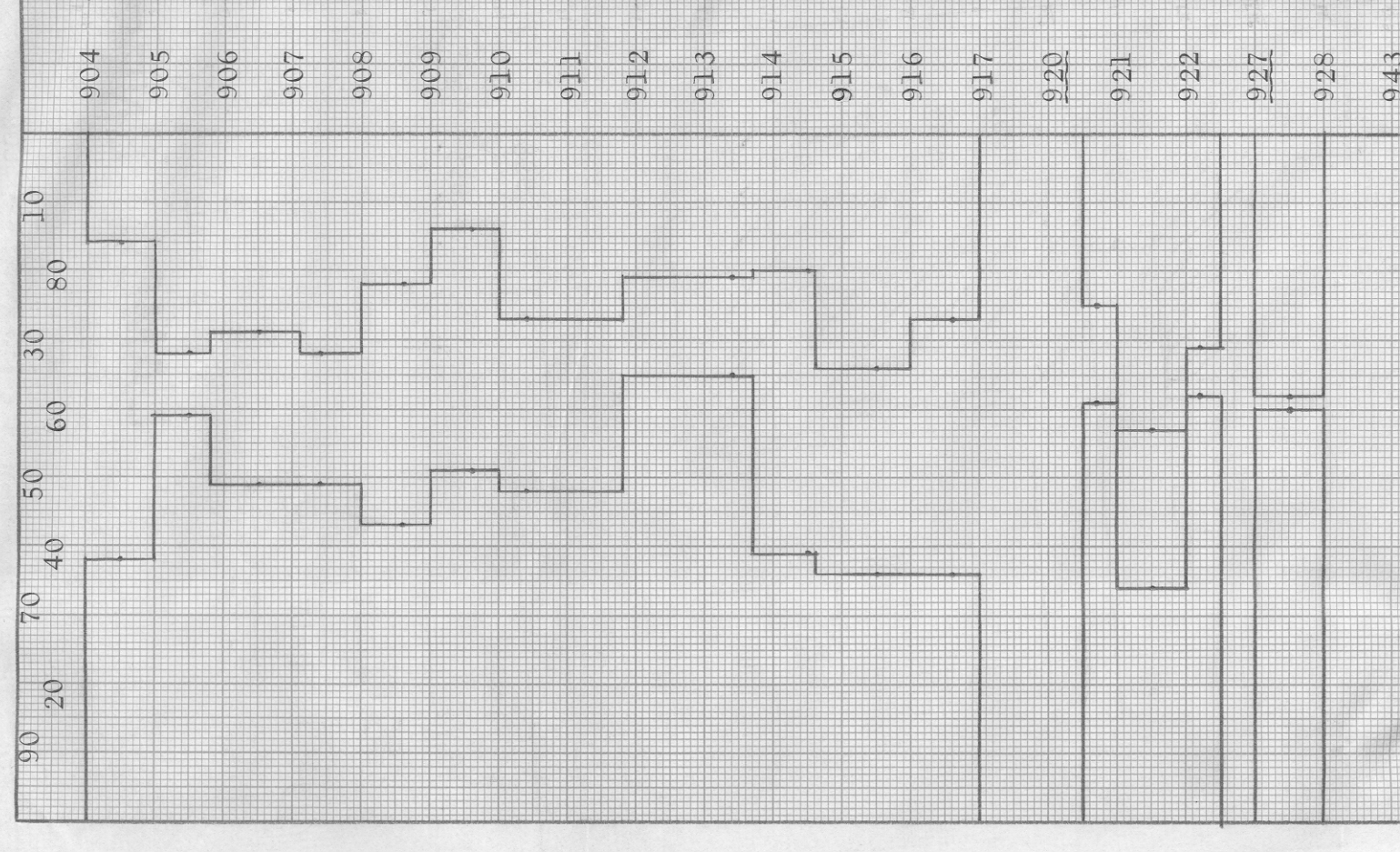
Company	Lamco Energy, Inc.	Lease	Stan Stitt	Well No.	C-34
Depth Interval, Feet	981.0 - 990.0		990.0 - 998.6		981.0 - 998.6
			<u>LOWER BARTLESVILLE SAND</u>		
Feet of Core Analyzed	4.3		6.0		10.3
Average Percent Porosity	19.9		19.9		19.9
Average Percent Original Oil Saturation	35.3		35.0		35.1
Average Percent Oil Recovery	3.5		2.7		3.0
Average Percent Residual Oil Saturation	31.8		32.3		32.1
Average Percent Residual Water Saturation	60.2		62.0		61.3
Average Percent Total Residual Fluid Saturation	92.0		94.3		93.4
Average Original Oil Content, Bbls./A. Ft.	536.		539.		538.
Average Oil Recovery, Bbls./A. Ft.	51.		41.		45.
Average Residual Oil Content, Bbls./A. Ft.	485.		498.		493.
Total Original Oil Content, Bbls./Acre	2,308.		3,232.		5,540.
Total Oil Recovery, Bbls./Acre	221.		246.		467.
Total Residual Oil Content, Bbls./Acre	2,087.		2,986.		5,073.
Average Effective Permeability, Millidarcys	17.5		11.1		13.78
Average Initial Fluid Production Pressure, p.s.i.	12.5		15.8		14.5

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

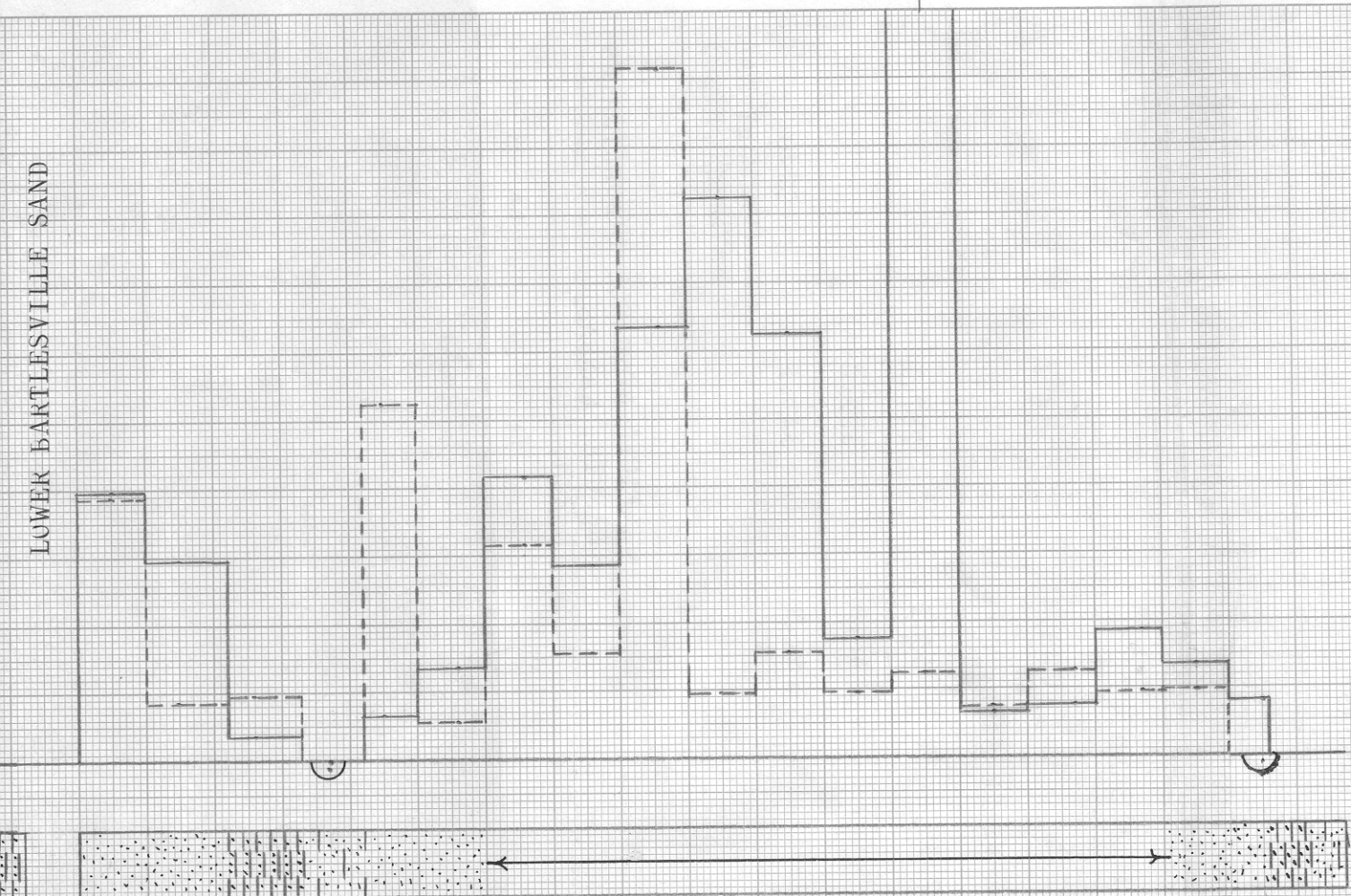
PERMEABILITY, IN MILLIDARCY
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCY



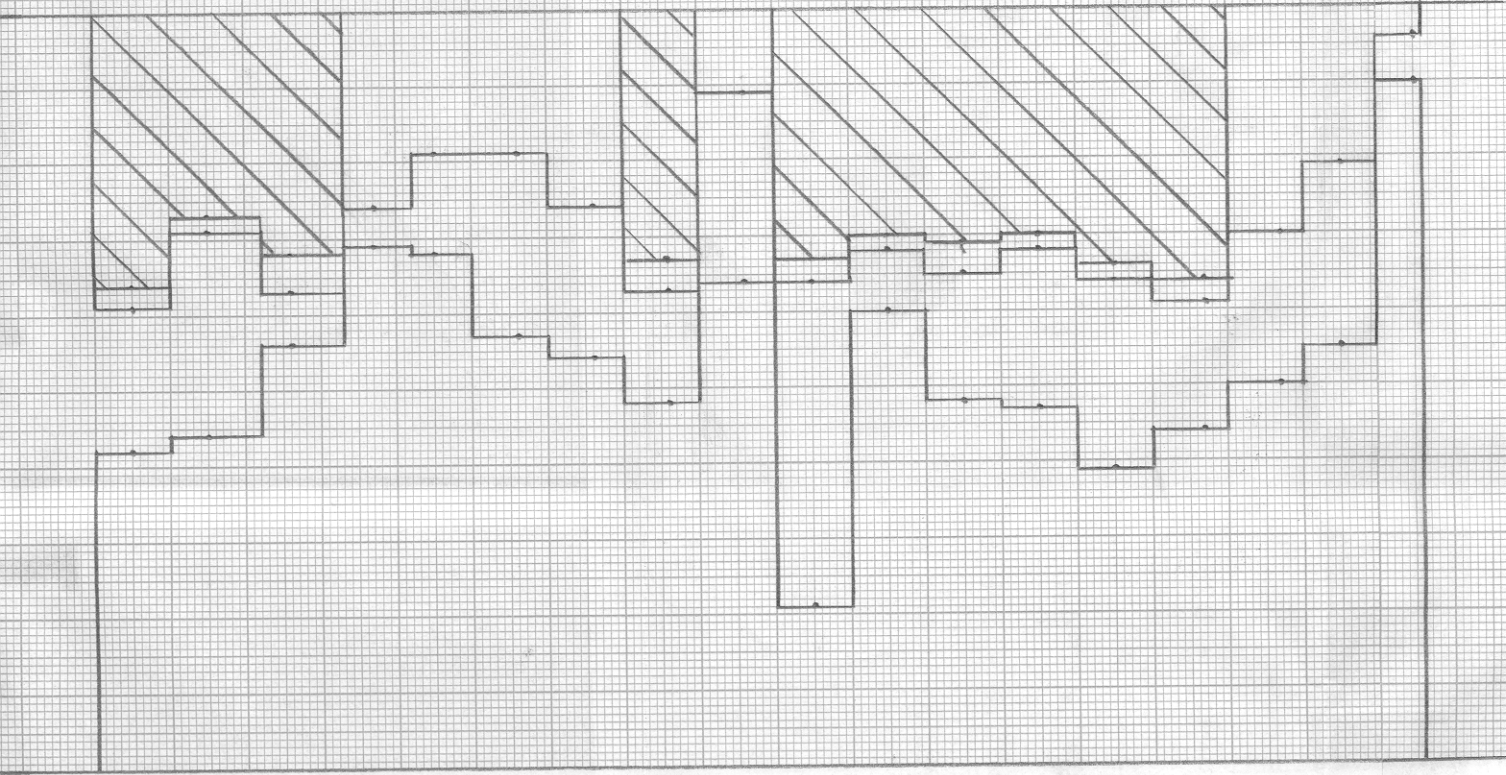
WATER SAT., PERCENT
OIL SAT., PERCENT



LOWER BARTLESVILLE SAND



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KEY:

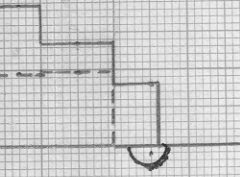


SANDY SHALE


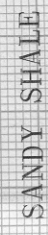






SANDSTONE

997
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KEY:

-  SANDY SHALE
-  SHALY SANDSTONE
-  LAMINATED SANDSTONE AND SHALE
-  SANDSTONE
-  FLOODPOT RESIDUAL OIL SATURATION
-  IMPERMEABLE TO WATER

LAMCO ENERGY, INC.

STAN STITT LEASE

WELL NO. C - 34

NEOSHO COUNTY, KANSAS

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

BARTLESVILLE SAND

904.0 - 928.0	16.0	14.3	27.1	48.4	6.6	----
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LOWER BARTLESVILLE SAND

981.0 - 990.0	9.0	19.3	27.3	55.1	287.1	
990.0 - 998.6	8.6	19.2	30.6	48.6	392.0	
981.0 - 998.6	17.6	19.2	28.9	51.9	341.1	2240 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
MARCH, 1981

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