



OILFIELD RESEARCH LABORATORIES

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

June 13, 1979

Diamond Oil Producers, Inc.
114 South Depot
Cherryvale, Kansas 67335

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Mattox "A" Lease, Well No. 4, Labette County, Kansas, and submitted to our laboratory on June 4, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman
Benjamin R. Pearman

SAM:km
5 c to Cherryvale, Kansas

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GENERAL INFORMATION & SUMMARY

Company Diamond Oil Producers, Inc. Lease Mattox "A" Well No. 4

Location 825' EWL & 825' SNL NW NW

Section 7 Twp. 33S Rge. 18E County Labette State Kansas

Name of Sand - - - - - Bartlesville

Top of Core - - - - - 610.0

Bottom of Core - - - - - 630.0

Top of Sand - - - - - 610.0

Bottom of Sand - - - - - 630.0

Total Feet of Permeable Sand - - - - - 19.7

Total Feet of Floodable Sand - - - - - 15.9

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 10	2.0	2.0
10 - 20	6.1	8.1
20 - 40	9.8	17.9
40 & Above	1.8	19.7

Average Permeability Millidarcys - - - - - 26.9

Average Percent Porosity - - - - - 18.1

Average Percent Oil Saturation - - - - - 30.5

Average Percent Water Saturation - - - - - 40.3

Average Oil Content, Bbls./A. Ft. - - - - - 429.

Total Oil Content, Bbls./Acre - - - - - 8,460.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 5.6

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 80.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 1,255.

(Primary & Waterflooding)
Total Calculated Oil Recovery, Bbls./Acre - - - - - 5,660.

Packer Setting, Feet - - - - -

Viscosity, Centipoises @ - - - - -

A. P. I. Gravity, degrees @ 60 °F - - - - -

Elevation, Feet - - - - -

The core was sampled and the samples sealed in plastic bags by an agent of the client. The drilling fluid consisted of fresh water mud.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
610.0 - 615.8	Brown sandstone.
615.8 - 616.8	Brown conglomeratic sandstone.
616.8 - 626.1	Brown sandstone.
626.1 - 626.4	Gray finely laminated sandstone and shale.
626.4 - 630.0	Brown sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,255 barrels of oil per acre was obtained from 15.9 feet of sand. The weighted average percent oil saturation was reduced from 31.9 to 26.3, or represents an average recovery of 5.6 percent. The weighted average effective permeability of the samples is 1.31 millidarcys, while the average initial fluid production pressure is 23.1 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 20 samples tested, 19 produced water and 16 oil. This indicates that approximately 80 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 5,660 barrels of oil per acre. This is an average recovery of 356 barrels per acre foot from 15.9 feet of floodable sand analyzed in this core.

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

Original formation volume factor	1.05
Reservoir water saturation, percent	20.0
Average porosity, percent	18.4
Oil saturation after flooding, percent	26.3
Performance factor, percent	50.0
Net floodable pay sand, feet	15.9

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Diamond Oil Producers, Inc. Lease Mattox "A" Well No. 4

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	610.5	16.4	32	43	75	407	17.	1.0	1.0	407	17.00
2	611.5	17.0	29	44	73	383	18.	1.0	2.0	383	18.00
3	612.5	17.0	36	41	77	475	21.	1.0	3.0	475	21.00
4	613.5	17.7	30	43	73	412	19.	1.0	4.0	412	19.00
5	614.5	16.6	33	43	76	425	25.	1.0	5.0	425	25.00
6	615.5	19.3	42	31	73	629	48.	0.8	5.8	503	38.40
7	616.5	16.1	19	49	68	237	3.	1.0	6.8	237	3.30
8	617.5	19.8	30	39	69	461	34.	1.2	8.0	553	40.80
9	618.5	19.9	37	30	67	571	25.	1.0	9.0	571	25.00
10	619.5	20.6	25	42	67	400	37.	1.0	10.0	400	37.00
11	620.5	16.6	22	50	72	283	16.	1.0	11.0	283	16.00
12	621.5	19.3	27	41	68	404	20.	1.0	12.0	404	20.00
13	622.5	17.5	41	36	77	557	21.	1.0	13.0	557	21.00
14	623.5	18.7	27	41	68	392	40.	1.0	14.0	392	40.00
15	624.5	18.9	36	30	66	528	84.	1.0	15.0	528	84.00
16	625.5	19.7	35	32	67	535	17.	1.1	16.1	589	18.70
17	626.7	17.5	29	45	74	394	30.	0.6	16.7	236	18.00
18	627.5	18.4	23	46	69	328	22.	1.0	17.7	328	22.00
19	628.5	16.7	29	42	71	376	8.8	1.0	18.7	376	8.80
20	629.5	17.8	29	39	68	401	38.	1.0	19.7	401	38.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Diamond Oil Producers, Inc.		Lease	Mattox "A"	Well No.	
						4	
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	
610.0 - 616.8	6.8	17.1	31.3	42.3	418	2,842	
616.8 - 630.0	12.9	18.6	30.1	39.2	436	5,618	
610.0 - 630.0	19.7	18.1	30.5	40.3	429	8,460	
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Permeability Capacity Ft. x Md.	
610.0 - 616.8	6.8					141.70	
616.8 - 630.0	12.9					389.30	
610.0 - 630.0	19.7					531.00	

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company		Diamond Oil Producers, Inc.		Lease		Mattox "A"		Well No.		4	
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			
1	610.5	16.6	32	412	8	103	24	68	20	0.42	25
2	611.5	16.8	29	378	6	78	23	69	17	0.33	30
3	612.5	17.3	36	483	7	94	29	65	21	0.42	25
4	613.5	17.7	30	412	4	55	26	65	18	0.33	30
5	614.5	17.1	33	438	6	80	27	67	21	0.42	25
6	615.5	19.8	42	645	6	92	36	60	67	1.57	20
7	616.5	16.1	20	250	0	0	20	70	10	0.21	25
8	617.5	19.7	30	458	0	0	30	72	0	Imp.	-
9	618.5	19.9	37	571	7	108	30	64	60	1.20	20
10	619.5	20.1	25	390	2	31	23	62	22	0.58	30
11	620.5	17.1	22	292	0	0	22	70	25	0.50	20
12	621.5	19.5	27	409	3	46	24	70	31	0.53	25
13	622.5	18.0	41	573	10	140	31	67	114	2.27	20
14	623.5	19.0	27	398	4	59	23	72	111	2.62	20
15	624.5	19.1	36	534	11	163	25	68	196	4.33	20
16	625.5	19.9	35	541	5	78	30	68	133	3.07	20
17	626.7	17.2	29	387	0	0	29	62	11	0.19	30
18	627.5	18.5	23	330	2	29	21	77	32	0.59	20
19	628.5	17.2	29	387	4	54	25	70	53	1.20	20
20	629.5	18.1	29	407	4	56	25	71	44	0.97	20

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	Diamond Oil Producers, Inc.	Lease	Mattox "A"	Well No.	4
Depth Interval, Feet	610.0 - 616.8	616.8 - 630.0	610.0 - 630.0		
Feet of Core Analyzed	5.8	10.1	15.9		
Average Percent Porosity	17.5	18.9	18.4		
Average Percent Original Oil Saturation	33.4	30.9	31.9		
Average Percent Oil Recovery	6.2	5.2	5.6		
Average Percent Residual Oil Saturation	27.2	25.7	26.3		
Average Percent Residual Water Saturation	65.9	68.9	67.8		
Average Percent Total Residual Fluid Saturation	93.1	94.6	94.1		
Average Original Oil Content, Bbls./A. Ft.	456.	455.	456.		
Average Oil Recovery, Bbls./A. Ft.	84.	76.	80.		
Average Residual Oil Content, Bbls./A. Ft.	372.	379.	376.		
Total Original Oil Content, Bbls./Acre	2,639.	4,594.	7,233.		
Total Oil Recovery, Bbls./Acre	484.	772.	1,255.		
Total Residual Oil Content, Bbls./Acre	2,155.	3,822.	5,978.		
Average Effective Permeability, Millidarcys	0.55	1.75	1.31		
Average Initial Fluid Production Pressure, p.s.i.	25.8	21.5	23.1		

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