

OILFIELD RESEARCH LABORATORIES

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

December 27, 1980

Dodson Production Company
P. O. Box 384
Cherryvale, Kansas 67335

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Wagner Lease, Well No. 6, located in Labette County, Kansas and submitted to our laboratory on October 22, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Cherryvale, Kansas

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GENERAL INFORMATION & SUMMARY

Company Dodson Production Co. Lease Wagner Well No. 6
 Location 1155' EWL & 825' NSL - NE $\frac{1}{4}$
 Section 2 Twp 32S Rge 17E County Labette State Kansas

Elevation, Feet - - - - -

Name of Sand - - - - - Bartlesville

Top of Core - - - - - 686.0

Bottom of Core - - - - - 699.0

Top of Sand - - - - - 686.0

Bottom of Sand - - - - - 698.8

Total Feet of Permeable Sand - - - - - 7.9

Total Feet of Floodable Sand - - - - - 2.2

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	4.0	4.0
5 - 10	2.7	6.7
10 - 15	1.2	7.9

Average Permeability Millidarcys - - - - - 5.9

Average Percent Porosity - - - - - 16.8

Average Percent Oil Saturation - - - - - 29.0

Average Percent Water Saturation - - - - - 53.8

Average Oil Content, Bbls./A. Ft. - - - - - 377.

Total Oil Content, Bbls./Acre - - - - - 3352.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 2.6

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 35.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 78.

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 non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
686.0 - 686.7	Light brown slightly calcareous shaly sandstone.
686.7 - 687.9	Light brown slightly calcareous sandstone.
687.9 - 698.8	Light brown slightly calcareous shaly sandstone.
698.8 - 699.0	Gray sandy shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 78 barrels of oil per acre was obtained from 2.2 feet of sand. The weighted average percent oil saturation was reduced from 33.7 to 31.1, or represents an average recovery of 2.6 percent. The weighted average effective permeability of the samples is 0.43 millidarcys, while the average initial fluid production pressure is 40.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 9 samples tested, 2 produced water and oil, and 5 samples produced water only. This indicates that approximately 22 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 390 barrels of oil per acre. This is an average recovery of 178 barrels per acre foot from 2.2 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	40.0
Average porosity, percent	17.6
Oil saturation after flooding, percent	31.1
Performance factor, percent, estimated	50.0
Net floodable sand, feet	2.2

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Dodson Production Company Lease Wagner Well No. 6

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	686.5	17.3	29	46	75	389	6.3	0.7	0.7	272	4.41
2	687.7	18.7	35	41	76	508	15.	1.2	1.9	610	18.00
3	689.5	16.8	29	55	84	378	7.4	1.0	2.9	378	7.40
4	691.5	16.4	32	53	85	407	4.1	1.0	3.9	407	4.10
5	692.4	16.1	26	55	81	325	5.2	1.0	4.9	325	5.20
6	694.5	15.8	24	59	83	294	2.6	1.0	5.9	294	2.60
7	695.9	18.5	24	56	80	345	1.9	1.0	6.9	345	1.90
8	697.5	17.2	21	67	88	280	3.3	1.0	7.9	280	3.30
9	698.5	14.2	40	52	92	441	Imp.	1.0	8.9	441	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Dodson Production Company		Lease		Wagner		Well No.	
		Depth Interval, Feet	Feet of Core Analyzed			Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
		686.0 - 698.8	7.9			5.9	46.91		
		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	
		686.0 - 698.8	8.9	16.8	29.0	53.8	377	3,352	

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Dodson Production Company Lease Wagner Well No. 6

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	686.5	17.2	29	387	0	0	29	65	48	0.68	35
2	687.7	18.6	35	505	3	43	32	64	39	0.67	35
3	689.5	16.7	29	376	0	0	29	68	18	0.22	40
4	691.5	16.5	32	410	2	26	30	66	21	0.15	45
5	692.4	16.2	26	327	0	0	26	56	0	Imp.	-
6	694.5	16.1	23	287	0	0	23	71	14	0.22	40
7	695.9	18.0	25	349	0	0	25	70	48	0.68	30
8	697.5	17.5	21	285	0	0	21	73	33	0.52	30
9	698.5	14.5	39	439	0	0	39	54	0	Imp.	-

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	Dodson Production Company	Lease	Wagner	Well No.	6
Depth Interval, Feet	686.0 - 698.8				
Feet of Core Analyzed	2.2				
Average Percent Porosity	17.6				
Average Percent Original Oil Saturation	33.7				
Average Percent Oil Recovery	2.6				
Average Percent Residual Oil Saturation	31.1				
Average Percent Residual Water Saturation	64.9				
Average Percent Total Residual Fluid Saturation	96.0				
Average Original Oil Content, Bbls./A. Ft.	462.				
Average Oil Recovery, Bbls./A. Ft.	35.				
Average Residual Oil Content, Bbls./A. Ft.	427.				
Total Original Oil Content, Bbls./Acre	1016.				
Total Oil Recovery, Bbls./Acre	78.				
Total Residual Oil Content, Bbls./Acre	938.				
Average Effective Permeability, Millidarcys	0.43				
Average Initial Fluid Production Pressure, p.s.i.	40.0				

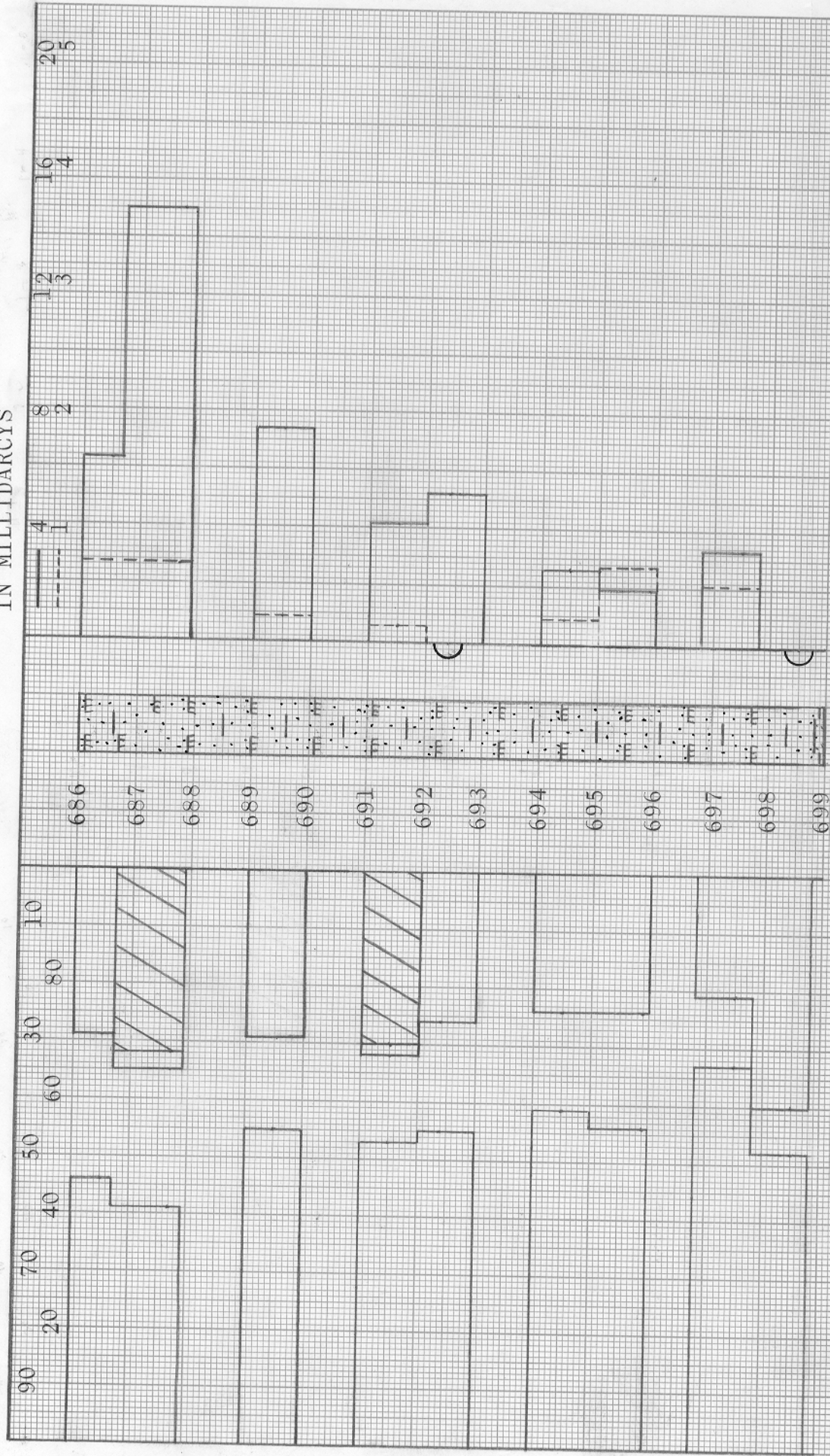
NOTE: Only those samples which recovered oil were used in calculating the above averages.

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WATER SAT., ———→
PERCENT

←——
OIL SAT.,
PERCENT

———— PERMEABILITY, IN MILLIDARCYS
----- EFFECTIVE PERMEABILITY TO WATER,
IN MILLIDARCYS



KEY:

SHALY CALCAREOUS SANDSTONE

SANDY SHALE

FLOODPOT RESIDUAL OIL SATURATION

CALCAREOUS SANDSTONE

IMPERMEABLE TO WATER

DODSON PRODUCTION CO.

WAGNER LEASE

WELL NO. 6

LABETTE COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY PERCENT	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY MILLIDARCS	CALCULATED OIL RECOVERY BBLs./ACRE
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686.0 - 698.8

8.9

16.8

29.0

53.8

5.9

390

(PRIMARY &
WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
DECEMBER, 1980

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