

OILFIELD RESEARCH LABORATORIES

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

March 24, 1981

Ajax Drilling Company
166 Harbor Drive # 2
Key Biscayne, Florida 33149

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Eisele Lease, Well No. 1, located in Franklin County, Kansas and submitted to our laboratory on February 20, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

4 c to Key Biscayne, Florida
1 c to Rantoul, Kansas

- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Ajax Drilling Company Lease Eisele Well No. 1

Location _____

Section _____ Twp. _____ Rge. _____ County Franklin State Kansas

Elevation, Feet

Name of Sand..... 1st Squirrel

Top of Core 724.0

Bottom of Core 732.1

Top of Sand 724.0

Bottom of Sand 732.1

Total Feet of Permeable Sand 6.7

Total Feet of Floodable Sand 2.9

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 12	2.8	2.8
16 - 24	2.9	5.7
24 - 30	1.0	6.7

Average Permeability Millidarcys 16.5

Average Percent Porosity 16.6

Average Percent Oil Saturation 35.7

Average Percent Water Saturation 29.7

Average Oil Content, Bbls./A. Ft. 480.

Total Oil Content, Bbls./Acre 3,890.

Average Percent Oil Recovery by Laboratory Flooding Tests 3.3

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. 51.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre 148.

Total Calculated Oil Recovery, Bbls./Acre See "Calculated Recovery" Section

The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid. The core was reported to be from a virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
724.0 - 728.0	Brown slightly calcareous sandstone.
728.0 - 729.4	Hard grayish light brown limestone.
729.4 - 730.2	Brown calcareous sandstone.
730.2 - 731.1	Brown slightly calcareous sandstone.
731.1 - 732.1	Brown and gray laminated slightly calcareous sandstone and shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 148 barrels of oil per acre was obtained from 2.9 feet of sand. The weighted average percent oil saturation was reduced from 44.7 to 41.4, or represents an average recovery of 3.3 percent. The weighted average effective permeability of the samples is 3.72 millidarcys, while the average initial fluid production pressure is 26.7 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 8 samples tested, 3 produced water and oil. This indicates that approximately 38 percent of the sand represented by these samples is floodable pay sand.

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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 690 barrels of oil per acre. This is an average recovery of 238 barrels per acre foot from 2.9 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	20.0
Average porosity, percent	19.6
Oil saturation after flooding, percent	41.4
Performance factor, percent, estimated	45.0
Net floodable sand, feet	2.9

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Ajax Drilling Company Lease Eisele Well No. 1

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	Total			Ft.	Cum. Ft.		
1	724.5	20.4	43	23	66	681	29.	1.0	1.0	681	29.00
2	725.3	19.5	49	24	73	741	16.	1.0	2.0	741	16.00
3	726.2	17.2	39	29	68	520	10.	1.0	3.0	520	10.00
4	727.4	17.2	34	22	56	454	23.	1.0	4.0	454	23.00
5	728.6	13.0	28	64	92	282	Imp.	1.4	5.4	395	0.00
6	729.6	16.0	43	24	67	534	9.6	0.8	6.2	427	7.68
7	730.4	18.6	42	22	64	606	19.	0.9	7.1	545	17.10
8	731.6	12.6	13	14	27	127	7.5	1.0	8.1	127	7.50

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Ajax Drilling Company		Lease	Eisele	Well No.	
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Total Oil Content Bbls./Acre
724.0 - 732.1	8.1	16.6	6.7	16.5	110.28	3,890
724.0 - 732.1	8.1	16.6	6.7	16.5	110.28	3,890

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company			Ajax Drilling Company			Lease		Eisele		Well No.		1
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.
			%	Bbbls./A. Ft.	%	Bbbls./A. Ft.	% Oil	% Water	Bbbls./A. Ft.			
1	724.5	20.5	43	684	3	48	40	40	636	110	2.85	25
2	725.3	19.5	49	741	4	61	45	44	680	372	7.35	20
3	726.2	16.7	40	518	0	0	40	31	518	0	Imp.	-
4	727.4	17.3	34	456	0	0	34	23	456	0	Imp.	-
5	728.6	13.1	28	285	0	0	28	64	285	0	Imp.	-
6	729.6	16.4	42	534	0	0	42	26	534	0	Imp.	-
7	730.4	18.6	42	606	3	43	39	50	563	20	0.64	35
8	731.6	12.5	13	126	0	0	13	22	126	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.

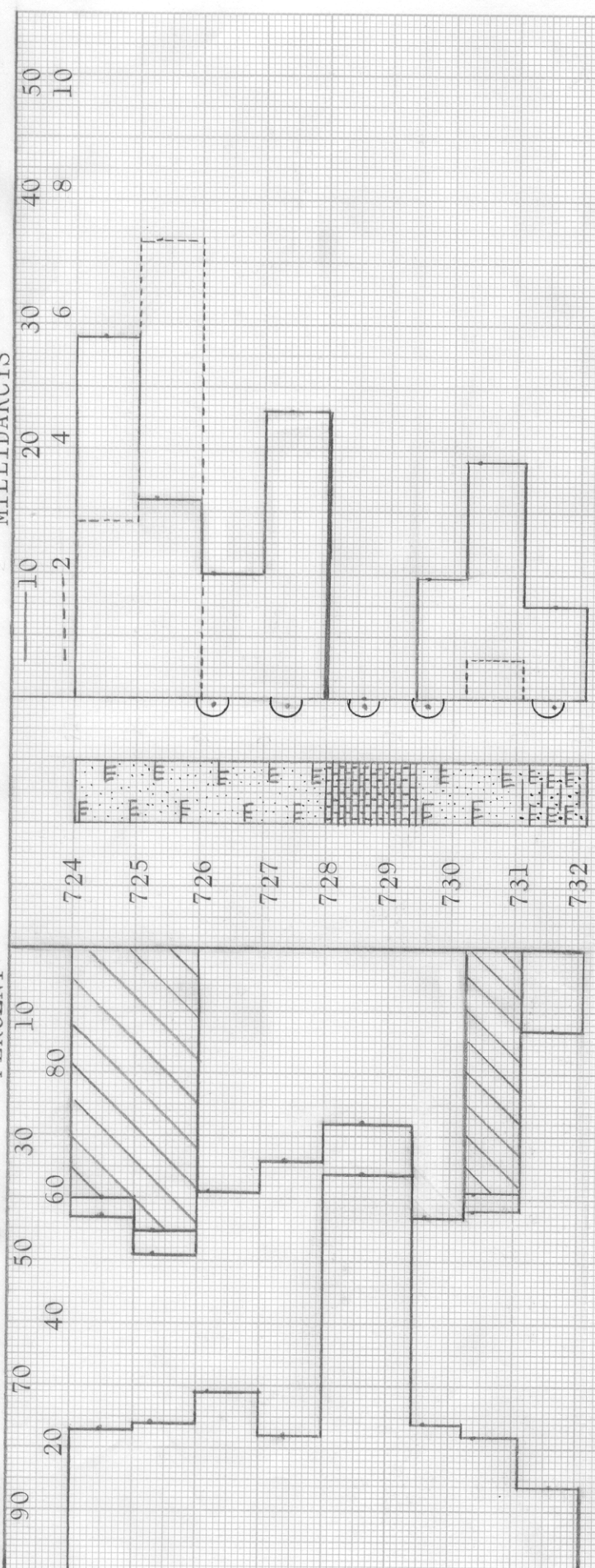
Oilfield Research Laboratories
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Lease	Eisele	Well No.
Ajax Drilling Company			1
Depth Interval, Feet	724.0 - 732.1		
Feet of Core Analyzed	2.9		
Average Percent Porosity	19.6		
Average Percent Original Oil Saturation	44.7		
Average Percent Oil Recovery	3.3		
Average Percent Residual Oil Saturation	41.4		
Average Percent Residual Water Saturation	44.5		
Average Percent Total Residual Fluid Saturation	85.9		
Average Original Oil Content, Bbls./A. Ft.	680.		
Average Oil Recovery, Bbls./A. Ft.	51.		
Average Residual Oil Content, Bbls./A. Ft.	629.		
Total Original Oil Content, Bbls./Acre	1,971.		
Total Oil Recovery, Bbls./Acre	148.		
Total Residual Oil Content, Bbls./Acre	1,823.		
Average Effective Permeability, Millidarcys	3.72		
Average Initial Fluid Production Pressure, p.s.i.	26.7		

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

WATER SAT., PERCENT —————> <———— OIL SAT., PERCENT
----- EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS



KEY:

- CALCAREOUS SANDSTONE
- LIMESTONE
- IMPERMEABLE TO WATER
- LAMINATED CALCAREOUS SANDSTONE AND SHALE
- FLOODPOT RESIDUAL OIL SATURATION

AJAX DRILLING COMPANY

EISELE LEASE
FRANKLIN COUNTY, KANSAS
WELL NO. 1

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BELS. / ACRE
724.0 - 732.1	8.1	16.6	35.7	29.7	16.5	690 (PRIMARY AND

AJAX DRILLING COMPANY

EISELE LEASE

WELL NO. 1

FRANKLIN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BELS. / ACRE
724.0 - 732.1	8.1	16.6	35.7	29.7	16.5	690
						(PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
MARCH, 1981

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