

OILFIELD RESEARCH LABORATORIES

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

October 8, 1980

Thompson Oil & Gas, Ltd.
1776 Lincoln St.
712 Denver Center Building
Denver, Colorado 80203

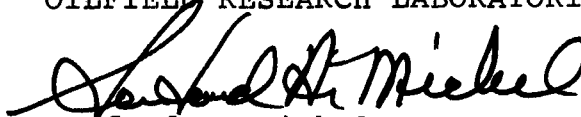
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Hess Lease, Well No. 2, Allen County, Kansas and submitted to our laboratory on July 11, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES



Sanford A. Michel

SAM/ks

5 c to Denver, Colorado

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GENERAL INFORMATION & SUMMARY

Company	Thompson Oil & Gas, Ltd.	Lease	Hess	Well No.	2
Location	-				
Section	28	Twp.	25S	Rge.	19E
				County	Allen
				State	Kansas
Elevation, Feet	-				
Name of Sand	Bartlesville				
Top of Core	832.0				
Bottom of Core	852.0				
Top of Sand	832.0				
Bottom of Sand	851.5				
Total Feet of Permeable Sand	4.9				
Total Feet of Floodable Sand	2.5				
Distribution of Permeable Sand:					
Permeability Range Millidarcys	Feet	Cum. Ft.			
0 - 5	0.7	0.7			
90 - 100	0.7	1.4			
200 - 400	2.0	3.4			
500 - 700	1.5	4.9			
Average Permeability Millidarcys	330.1				
Average Percent Porosity	18.9				
Average Percent Oil Saturation	51.3				
Average Percent Water Saturation	14.7				
Average Oil Content, Bbls./A. Ft.	745.				
Total Oil Content, Bbls./Acre	3876.				
Average Percent Oil Recovery by Laboratory Flooding Tests	9.8				
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	159.				
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	399.				
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section				

-2-

The core was sampled and the samples sealed in plastic bags by a representative of the client.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
832.0 - 832.3	Brown shaly sandstone.
832.3 - 832.7	Brown very shaly sandstone.
832.7 - 836.6	Gray sandy shale.
836.6 - 836.9	Brown very shaly sandstone.
836.9 - 845.5	Gray sandy shale.
845.5 - 847.3	Brown and gray laminated sandstone and shale.
847.3 - 851.5	Dark brown slightly calcareous sandstone.
851.5 - 852.0	Coal.

LABORATORY FLOODING TESTS

The lower portion of the sand in this core responded to laboratory flooding tests, as a total recovery of 399 barrels of oil per acre was obtained from 2.5 feet of sand. The weighted average percent oil saturation was reduced from 50.4 to 40.6, or represents an average recovery of 9.8 percent. The weighted average effective permeability of the samples is 13.15 millidarcys, while the average initial fluid production pressure is 11.7 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, and 1 sample produced water only. This indicates that approximately 38 percent of the sand represented by these samples is floodable pay sand.

CALCUALTED 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 920 barrels of oil per acre. This is an average recovery of 367 barrels per acre foot from 2.5 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	10.0
Average porosity, percent	21.0
Oil saturation after flooding, percent	40.6
Performance factor, percent, estimated	50.0
Net floodable sand, feet	2.5

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Thompson Oil & Gas, Ltd.

Lease Hess

Well No. 2

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	832.1	17.2	34	29	63	454	3.9	0.3	0.3	136	1.17
2	832.5	15.0	70	23	93	815	0.18	0.4	0.7	326	0.07
3	836.7	13.1	64	25	89	650	Imp.	0.3	1.0	195	0.00
4	847.6	18.9	53	10	63	777	97.	0.7	1.7	544	67.90
5	848.5	17.7	46	16	62	632	695.	1.0	2.7	632	695.00
6	849.5	21.8	45	15	60	761	253.	1.0	3.7	761	253.00
7	850.5	19.1	52	8	60	771	346.	1.0	4.7	771	346.00
8	851.3	22.7	58	10	68	1021	509.	0.5	5.2	511	254.50

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Thompson Oil & Gas, Ltd.		Lease		Hess		Well No. 2	
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			
832.0 - 849.0	2.7	17.0	52.0	17.9	679	1,833			
849.0 - 851.5	2.5	20.9	50.4	11.2	817	2,043			
832.0 - 851.5	5.2	18.9	51.3	14.7	745	3,876			

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
832.0 - 849.0	2.4	318.4	764.14
849.0 - 851.5	2.5	341.4	853.50
832.0 - 851.5	4.9	330.1	1617.64

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Thompson Oil & Gas, Ltd. Lease Hess Well No. 2

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	832.1	17.1	34	451	0	0	34	30	0	Imp.	-
2	832.5	14.6	71	804	0	0	71	25	0	Imp.	-
3	836.7	13.2	64	655	0	0	64	26	0	Imp.	-
4	847.6	18.7	53	769	0	0	53	42	270	2.62	15
5	848.5	17.6	46	628	0	0	46	18	0	Imp.	-
6	849.5	21.7	45	758	5	84	40	56	339	15.64	10
7	850.5	19.3	52	779	11	165	41	53	328	14.99	10
8	851.3	22.7	58	1021	17	299	41	51	503	4.50	15

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

2

Thompson Oil & Gas, Ltd.

Hess

Lease

Well No.

Company

Depth Interval, Feet

849.0 - 851.5

Feet of Core Analyzed

2.5

Average Percent Porosity

21.0

Average Percent Original Oil Saturation

50.4

Average Percent Oil Recovery

9.8

Average Percent Residual Oil Saturation

40.6

Average Percent Residual Water Saturation

53.8

Average Percent Total Residual Fluid Saturation

94.4

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

819.

Average Oil Recovery, Bbls./A. Ft.

159.

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

660.

Total Original Oil Content, Bbls./Acre

2048.

Total Oil Recovery, Bbls./Acre

399.

Total Residual Oil Content, Bbls./Acre

1649.

Average Effective Permeability, Millidarcys

13.15

Average Initial Fluid Production Pressure, p.s.i.

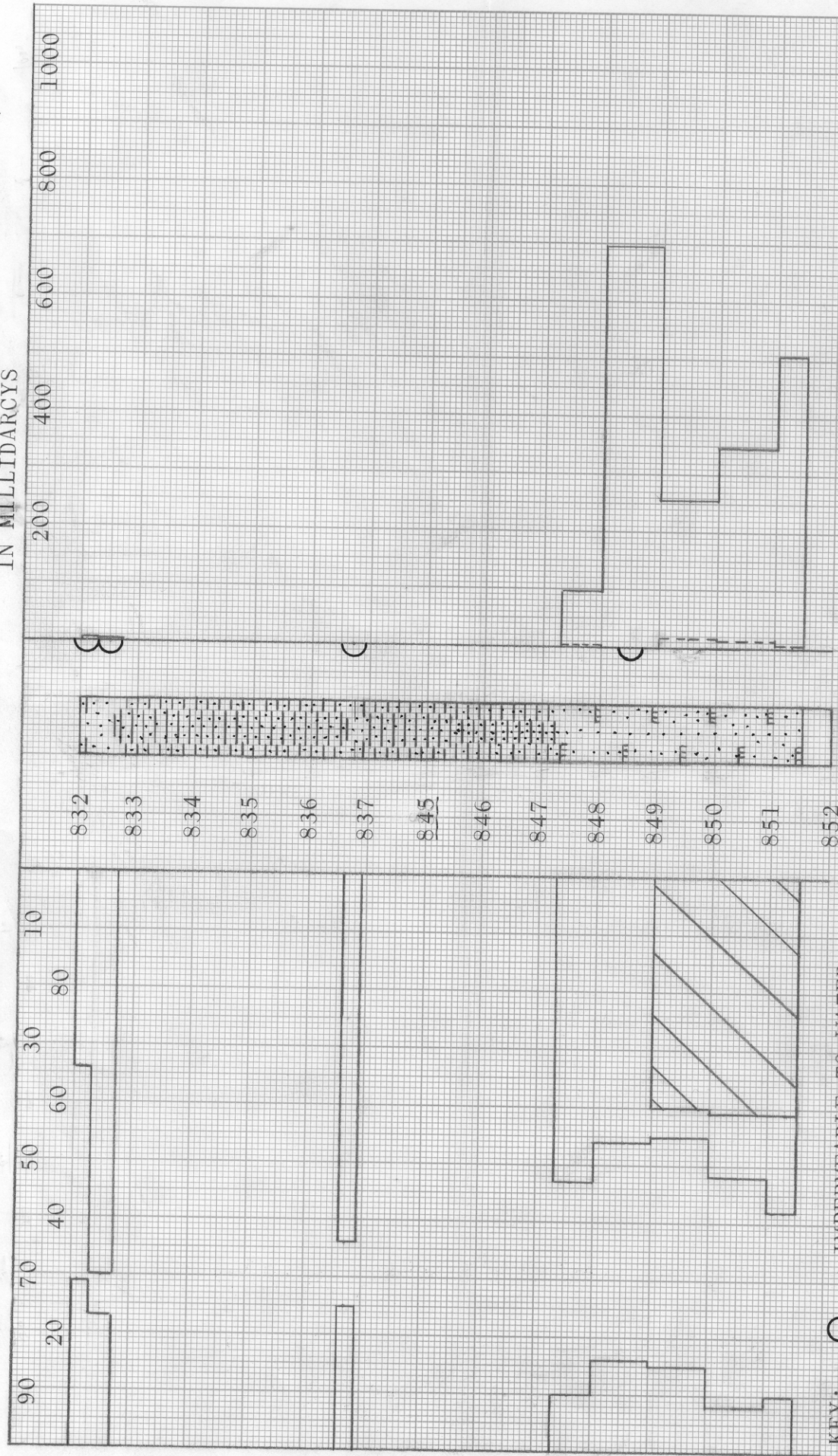
11.7

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: ○ IMPERMEABLE TO WATER

SHALY SANDSTONE

LAMINATED SANDSTONE & SHALE

COAL

SANDY SHALE

CALCAREOUS SANDSTONE

FLOODPOT RESIDUAL OIL SATURATION

THOMPSON OIL & GAS

THOMPSON OIL & GAS

HESS LEASE

WELL NO. 2

ALLEN 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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832.0 - 849.0	2.7	17.0	52.0	17.9	318.4	
849.0 - 851.5	2.5	20.9	50.4	11.2	341.4	
832.0 - 851.5	5.2	18.9	51.3	14.7	330.1	920

(PRIMARY &
WATERFLOODING)

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CHANUTE, KANSAS
SEPTEMBER, 1980

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