

OILFIELD RESEARCH LABORATORIES

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

June 22, 1981

October Oil Company
(Falcon Oilfield Services, Inc.)
P. O. Box 707
Chanute, Kansas 66720

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the K. Carlson Lease, Well No. Bx-3-25, located in Wilson County, Kansas and submitted to our laboratory on June 12, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Chanute, Kansas

- REGISTERED ENGINEERS -

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

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GENERAL INFORMATION & SUMMARY

Company Oilfield Oil Company
 (Falcon Oilfield Services, Inc.) Lease K. Carlson Well No. Bx-3-25
 Location 495' FSL & 495' FWL NE $\frac{1}{4}$ SW $\frac{1}{4}$
 Section 25 Twp. 27S Rge. 16E County Wilson State Kansas

Elevation, Feet	
Name of Sand	Squirrel
Top of Core	856.0
Bottom of Core	872.4
Top of Sand	856.0
Bottom of Sand	871.7
Total Feet of Permeable Sand	13.7
Total Feet of Floodable Sand	5.4

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	7.3	7.3
20 - 30	3.0	10.3
30 - 40	3.4	13.7

Average Permeability Millidarcys	15.7
Average Percent Porosity	14.7
Average Percent Oil Saturation	37.1
Average Percent Water Saturation	41.9
Average Oil Content, Bbls./A. Ft.	446.
Total Oil Content, Bbls./Acre	7,005.
Average Percent Oil Recovery by Laboratory Flooding Tests	11.5
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	161.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	870.
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. Salt 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>
856.0 - 859.8	Brown shaly sandstone.
859.8 - 866.2	Dark brown slightly calcareous sandstone.
866.2 - 868.6	Brown and gray laminated sandstone and shale.
868.6 - 871.7	Grayish light brown shaly sandstone.
871.7 - 872.4	Gray sandy shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 870 barrels of oil per acre was obtained from 5.4 feet of sand. The weighted average percent oil saturation was reduced from 45.9 to 34.4, or represents an average recovery of 11.5 percent. The weighted average effective permeability of the samples is 2.04 millidarcys, while the average initial fluid production pressure is 29.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 16 samples tested, 5 produced water and oil, and 2 samples produced water only. This indicates that approximately 31 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 1,710 barrels of oil per acre. This is an average recovery of 317 barrels per acre foot from 5.4 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.06
Reservoir water saturation, percent, estimated	20.0
Average porosity, percent	18.1
Oil saturation after flooding, percent	34.4
Performance factor, percent, estimated	55.0
Net floodable sand, feet	5.4

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

October Oil Co.
(Falcon Oilfield Services, Inc.)

K. Carlson

Well No. Bx-3-25

Company

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	856.6	6.2	28	64	92	135	0.37	1.0	1.0	135	0.37
2	857.4	13.6	30	46	76	317	4.5	1.0	2.0	317	4.50
3	858.4	14.3	64	29	93	710	0.65	1.0	3.0	710	0.65
4	859.5	12.0	41	48	89	382	1.0	0.8	3.8	306	0.80
5	860.5	18.2	55	20	75	777	31.	1.4	5.2	1088	43.40
6	861.6	16.9	42	36	78	551	37.	1.0	6.2	551	37.00
7	862.4	18.7	48	23	71	696	39.	1.0	7.2	696	39.00
8	863.4	17.8	48	31	79	663	28.	1.0	8.2	663	28.00
9	864.4	15.8	31	27	58	380	73.	1.0	9.2	380	23.00
10	865.4	18.2	33	25	58	466	28.	1.0	10.2	466	28.00
11	866.4	20.4	48	43	91	760	4.4	1.0	11.2	760	4.40
12	867.4	13.6	28	29	57	295	1.3	0.7	11.9	207	0.91
13	868.5	12.8	32	28	60	318	0.31	0.7	12.6	223	0.22
14	869.5	14.2	15	80	95	165	3.9	1.1	13.7	182	4.29
15	870.3	9.6	20	69	89	149	Imp.	1.0	14.7	149	0.00
16	871.5	10.1	22	71	93	172	Imp.	1.0	15.7	172	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

October Oil Company

(Falcon Oilfield Services, Inc.)

Lease K. Carlson

Well No. BX-3-25

Company

Depth Interval, Feet	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
856.0 - 866.2	856.0 - 866.2	10.2	20.1	204.72	42.5	34.1	521	5,312
866.2 - 871.7	866.2 - 871.7	3.5	2.8	9.82	27.0	56.5	308	1,693
856.0 - 871.7	856.0 - 871.7	13.7	15.7	214.54	37.1	41.9	446	7,005

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company		October Oil Company		Lease		K. Carlson		Well No.		Bx-3-25	
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			
1	856.6	6.3	28	137	0	0	28	65	0	Imp.	-
2	857.4	13.7	30	317	0	0	30	47	0	Imp.	-
3	858.4	14.2	64	705	0	0	64	30	0	Imp.	-
4	859.5	12.1	41	385	0	0	41	49	0	Imp.	-
5	860.5	18.3	55	781	20	284	35	47	174	3.22	25
6	861.6	17.0	42	554	12	158	30	65	105	1.95	30
7	862.4	18.8	48	700	10	146	38	58	147	2.40	30
8	863.4	17.9	48	667	9	125	39	43	82	0.82	30
9	864.4	15.9	31	382	0	0	31	28	0	Imp.	-
10	865.4	18.3	33	469	3	43	30	50	75	1.35	30
11	866.4	20.3	48	756	0	0	48	44	6	0.45	50
12	867.4	13.9	27	291	0	0	27	31	0	Imp.	-
13	868.5	12.9	32	320	0	0	32	29	0	Imp.	-
14	869.5	14.3	15	166	0	0	15	81	0	Imp.	-
15	870.3	9.7	20	151	0	0	20	70	12	0.90	25
16	871.5	10.0	22	171	0	0	22	72	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

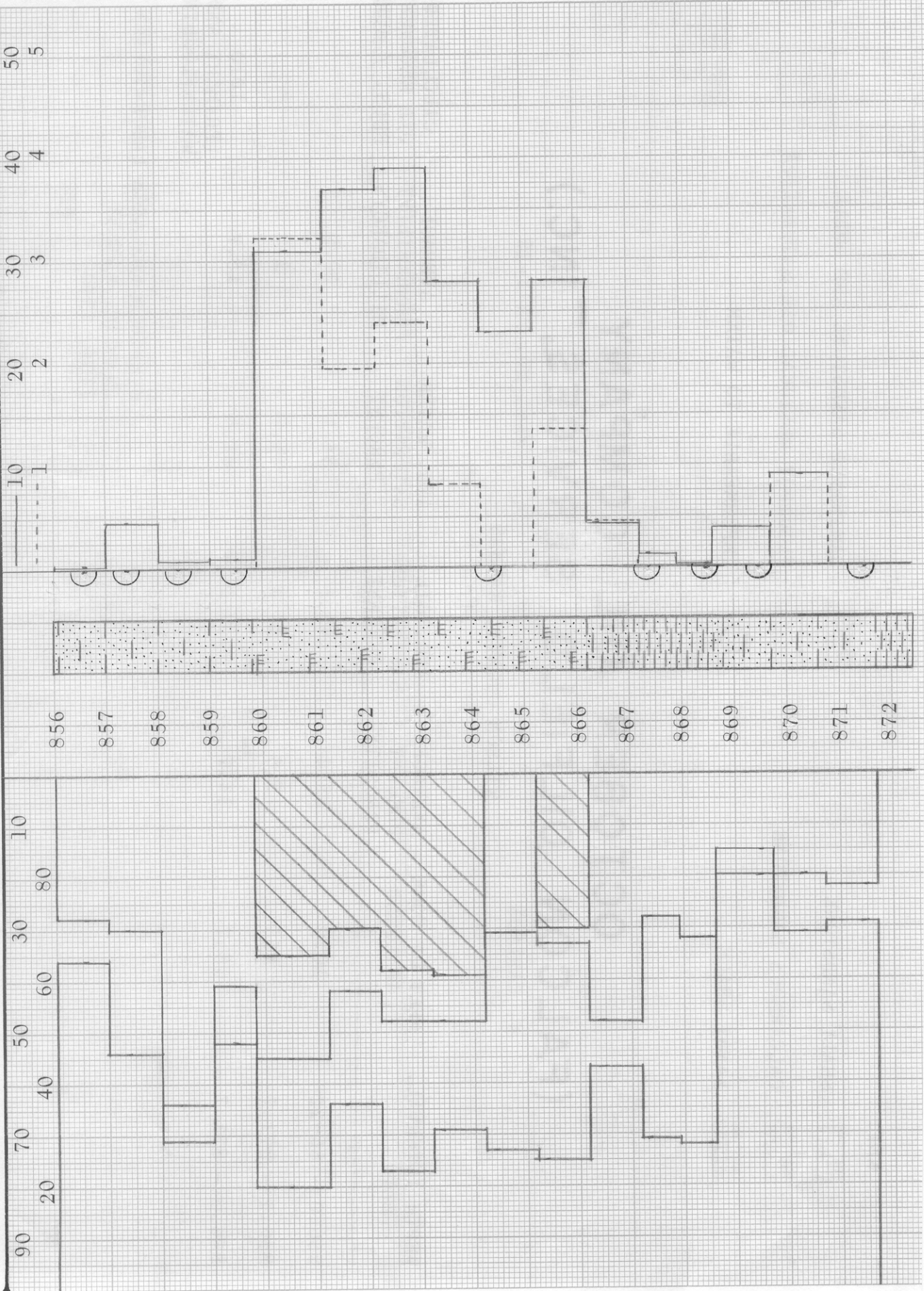
October Oil Company

Company (Falcon Oilfield Services, Inc.) Lease K. Carlson Well No. Bx-3-25

Depth Interval, Feet	856.0 - 866.2
Feet of Core Analyzed	5.4
Average Percent Porosity	18.1
Average Percent Original Oil Saturation	45.9
Average Percent Oil Recovery	11.5
Average Percent Residual Oil Saturation	34.4
Average Percent Residual Water Saturation	52.2
Average Percent Total Residual Fluid Saturation	86.6
Average Original Oil Content, Bbls./A. Ft.	645.
Average Oil Recovery, Bbls./A. Ft.	161.
Average Residual Oil Content, Bbls./A. Ft.	484.
Total Original Oil Content, Bbls./Acre	3,484.
Total Oil Recovery, Bbls./Acre	870.
Total Residual Oil Content, Bbls./Acre	2,614.
Average Effective Permeability, Millidarcys	2.04
Average Initial Fluid Production Pressure, p.s.i.	29.0

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

WATER SAT., PERCENT $\longrightarrow$ $\longleftarrow$ OIL SAT., PERCENT
 PERMEABILITY, IN MILLIDARCYS
 EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS



KEY:

SHALY SANDSTONE



LAMINATED SANDSTONE AND SHALE

CALCAREOUS SANDSTONE



FLOODPOT RESIDUAL OIL SATURATION

SANDY SHALE



IMPERMEABLE TO WATER

OCTOBER OIL COMPANY
(FALCON OILFIELD SERVICES, INC.)

K. CARLSON

WELL NO. BX-3-25

WILSON 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
856.0 - 866.2	10.2	15.4	42.5	34.1	20.1	
866.2 - 871.7	5.5	13.5	27.0	56.5	2.8	
856.0 - 871.7	15.7	14.7	37.1	41.9	15.7	1710 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JUNE, 1981
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