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

March 24, 1981

Inexco Oil Company
R R # 2, Box 3
Moran, Kansas 66755

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary cores taken from the Campbell Lease, Well No. F-16, located in Allen 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

3 c to Moran, Kansas
2 c to Oklahoma City, Oklahoma

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GENERAL INFORMATION & SUMMARY

Company Inexco Oil Company Lease Campbell Well No. F-16

Location

Section 18 Twp. 26S Rge. 21E County Allen State Kansas

Elevation, Feet

	Bartlesville	Tucker
Name of Sand		
Top of Core	735.0	818.0
Bottom of Core	750.0	829.6
Top of Sand	735.0	818.0
Bottom of Sand * (Tested)	* 748.5	828.5
Total Feet of Permeable Sand	11.1	3.1
Total Feet of Floodable Sand	6.4	0.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
	BARTLESVILLE SAND	
0 - 5	2.2	2.2
40 - 85	4.0	6.2
100 - 160	3.9	10.1
410 - 416	1.0	11.1
	TUCKER SAND	
0 - 10	0.4	0.4
35 - 205	2.7	3.1

Average Permeability Millidarcys	106.6	103.0
Average Percent Porosity	21.3	16.6
Average Percent Oil Saturation	43.1	34.5
Average Percent Water Saturation	24.8	44.9
Average Oil Content, Bbls./A. Ft.	698.	448.
Total Oil Content, Bbls./Acre	7,753.	2,062.
Average Percent Oil Recovery by Laboratory Flooding Tests	7.9	0.
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	135.	0.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	867.	0.
Total Calculated Oil Recovery, Bbls./Acre	See "Cal. Rec." Section	0.

The cores were sampled and the samples sealed in plastic bags by a representative of the client. Fresh water mud was used as a drilling fluid.

Since only the Bartlesville sand responded to flooding susceptibility tests, a calculated recovery is given for the Bartlesville sand only.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
	BARTLESVILLE SAND
735.0 - 742.0	Brown sandstone.
742.0 - 742.8	Brown shaly sandstone.
742.8 - 744.7	Brown sandstone.
744.7 - 747.1	Gray laminated sandstone and shale.
747.1 - 748.5	Brown and gray laminated sandstone and shale.
748.5 - 750.0	Gray laminated sandstone and shale.
	TUCKER SAND
818.0 - 819.4	Brown sandstone.
819.4 - 822.0	Light brown and gray laminated sandstone and shale.
822.0 - 822.4	Brown shaly sandstone.
822.4 - 825.8	Gray sandy shale.
825.8 - 827.2	Brown shaly sandstone.
827.2 - 828.5	Light brown sandstone.
828.5 - 829.6	Gray sandy shale.

LABORATORY FLOODING TESTS

BARTLESVILLE SAND

The Bartlesville sand in this core responded to laboratory flooding tests, as a total recovery of 867 barrels of oil per acre was obtained from 6.4 feet of sand. The weighted average percent oil saturation was reduced from 41.2 to 33.3, or represents an average recovery of 7.9 percent. The weighted average effective permeability of the samples is 8.92 millidarcys, while the average initial fluid production pressure is 21.7 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 14 samples tested, 6 produced water and oil, and 5 samples produced water only. This indicates that approximately 43 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

BARTLESVILLE SAND

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 2,690 barrels of oil per acre. This is an average recovery of 420 barrels per acre foot from 6.4 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	15.0
Average porosity, percent,	22.6
Oil saturation after flooding, percent	33.3
Performance factor, percent, estimated	50.0
Net floodable sand, feet	6.4

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Inexco Oil Company Lease Campbell Well No. F-16

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.		
						BARTLESVILLE SAND					
1	735.6	21.5	40	18	58	667	42.	1.5	1.5	1001	63.00
2	737.4	22.7	42	19	61	740	83.	1.5	3.0	1110	124.50
3	738.8	24.5	34	26	60	646	104.	1.0	4.0	646	104.00
4	739.5	22.5	45	26	71	786	158.	1.0	5.0	786	158.00
5	740.9	23.3	39	25	64	705	43.	1.0	6.0	705	43.00
6	741.4	22.3	39	33	72	675	153.	1.0	7.0	675	153.00
7	742.2	15.5	53	44	97	637	2.0	0.8	7.8	510	1.60
8	743.4	24.5	38	32	70	722	415.	1.0	8.8	722	415.00
9	744.5	20.6	53	24	77	847	130.	0.9	9.7	762	117.00
10	747.7	15.4	50	15	65	597	3.0	1.4	11.1	836	4.20
						TUCKER SAND					
11	818.8	15.7	54	25	79	658	37.	1.4	1.4	921	51.80
12	820.8	11.5	18	70	88	161	Imp.	1.5	2.9	242	0.00
13	822.2	14.7	53	23	76	604	9.2	0.4	3.3	242	3.68
14	827.5	24.1	27	44	71	505	203.	1.3	4.6	657	263.90

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Inexco Oil Company Lease Campbell Well No. F-16

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
	BARTLESVILLE SAND		
735.0 - 748.5	11.1	106.6	1,183.30
	TUCKER SAND		
818.0 - 828.5	3.1	103.0	319.38

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
			BARTLESVILLE SAND			
735.0 - 748.5	11.1	21.3	43.1	24.8	698	7,753
			TUCKER SAND			
818.0 - 828.5	4.6	16.6	34.5	44.9	448	2,062

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Inexco Oil Company Lease Campbell Well No. F-16

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	Bbls./A. Ft.			
						BARTLESVILLE SAND						
1	735.6	21.6	40	670	7	117	33	54	553	56	1.35	45
2	737.4	22.2	43	741	0	0	43	22	741	0	Imp.	-
3	738.8	24.3	34	641	4	75	30	58	566	254	10.99	20
4	739.5	22.5	45	785	10	175	35	52	610	306	7.80	15
5	740.9	23.4	39	708	0	0	39	53	708	204	10.50	25
6	741.4	22.2	39	672	5	86	34	51	586	318	15.55	20
7	742.2	15.6	53	641	0	0	53	44	641	23	0.50	15
8	743.4	24.3	38	716	5	94	33	57	622	248	11.78	15
9	744.5	20.8	53	855	18	290	35	52	565	224	9.93	15
10	747.7	15.4	50	597	0	0	50	37	597	0	Imp.	-
						TUCKER SAND						
11	818.8	15.8	54	662	0	0	54	40	662	128	3.30	35
12	820.8	11.5	18	161	0	0	18	71	161	0	Imp.	-
13	822.2	14.8	53	609	0	0	53	30	609	306	8.85	20
14	827.5	24.0	27	503	0	0	27	64	503	292	31.49	10

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

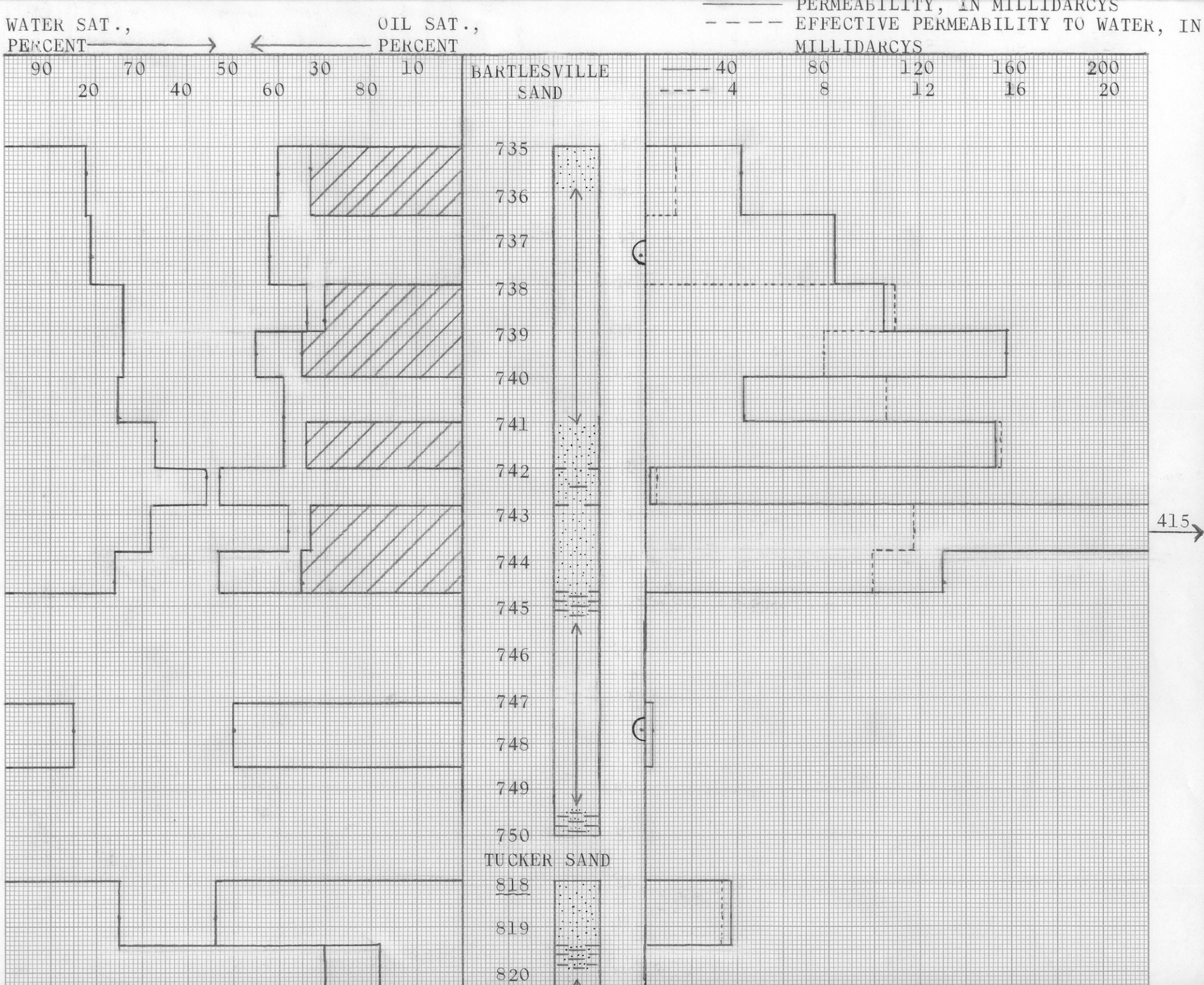
TABLE V

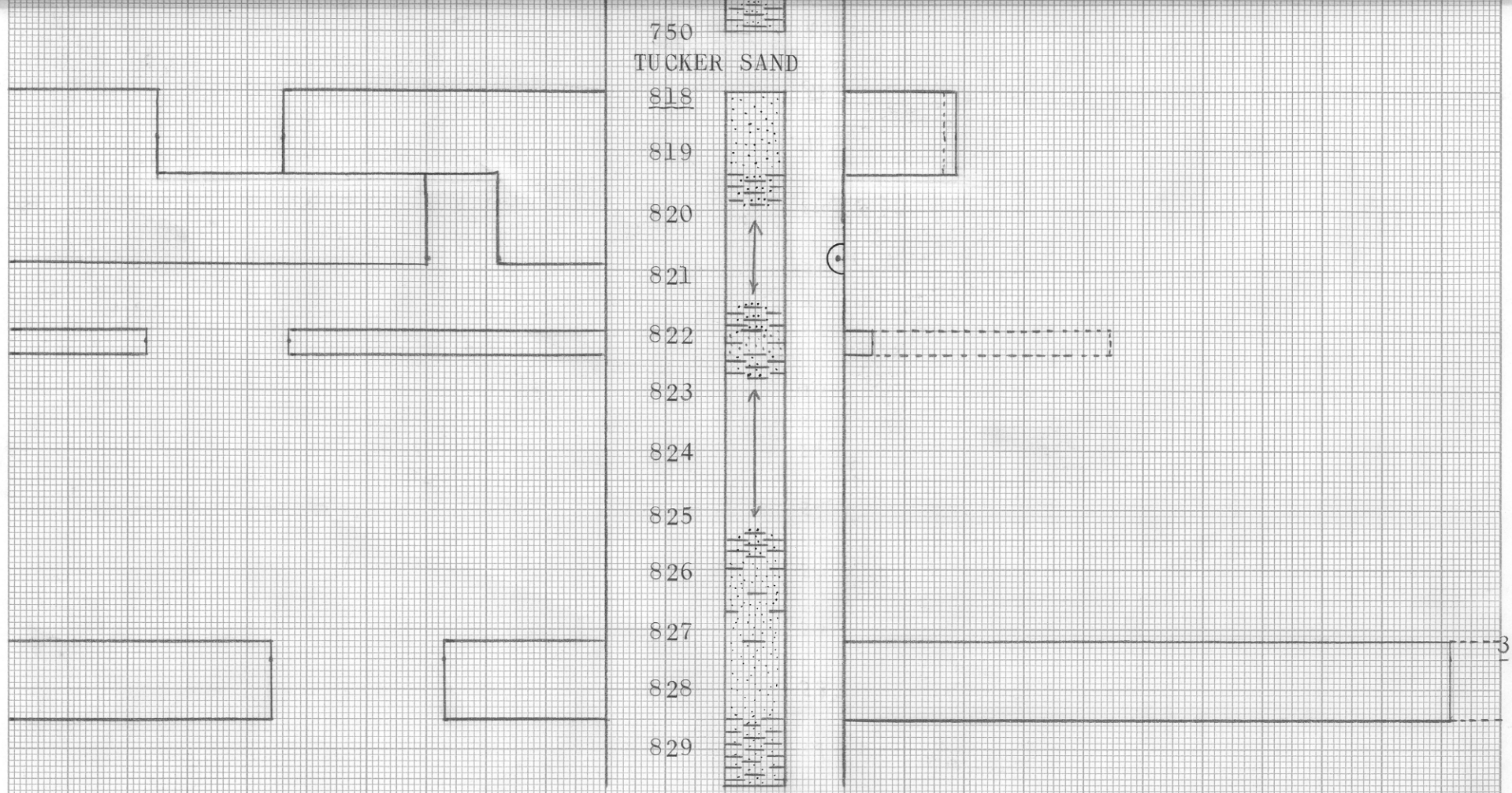
Company Inexco Oil Company Lease Campbell Well No. F-16

BARTLESVILLE SAND

Depth Interval, Feet	735.0 - 748.5
Feet of Core Analyzed	6.4
Average Percent Porosity	22.6
Average Percent Original Oil Saturation	41.2
Average Percent Oil Recovery	7.9
Average Percent Residual Oil Saturation	33.3
Average Percent Residual Water Saturation	54.0
Average Percent Total Residual Fluid Saturation	87.3
Average Original Oil Content, Bbls./A. Ft.	717.
Average Oil Recovery, Bbls./A. Ft.	135.
Average Residual Oil Content, Bbls./A. Ft.	582.
Total Original Oil Content, Bbls./Acre	4,590.
Total Oil Recovery, Bbls./Acre	867.
Total Residual Oil Content, Bbls./Acre	3,723.
Average Effective Permeability, Millidarcys	8.92
Average Initial Fluid Production Pressure, p.s.i.	21.7

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


WATER SAT., PERCENT
OIL SAT., PERCENT
PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS
90 70 50 30 10
20 40 60 80
40 80 120 160 200
4 8 12 16 20
BARTLESVILLE SAND
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
TUCKER SAND
818
819
820
415



KEY:

SANDSTONE

SANDY SHALE

SHALY SANDSTONE

LAMINATED SANDSTONE AND SHALE

FLOODPOT RESIDUAL OIL SATURATION

IMPERMEABLE TO WATER

INEXCO OIL COMPANY

CAMPBELL LEASE WELL NO. F-16

ALLEN COUNTY, KANSAS

INEXCO OIL COMPANY

CAMPBELL LEASE WELL NO. F-16

ALLEN 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 BBLS. / ACRE
			BARTLESVILLE SAND			
735.0 - 748.5	11.1	21.3	43.1	24.8	106.6	2690 (PRIMARY AND WATERFLOODING)
			TUCKER SAND			
818.0 - 828.5	4.6	16.6	34.5	44.9	103.0	-

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
MARCH, 1981

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