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

December 28, 1981

Inexco Oil Company
Rural Route # 2
Box 3
Moran, Kansas 66755

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Campbell Lease, Well No. G-18, located in Allen County, Kansas and submitted to our laboratory on December 22, 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

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Inexco Oil Company Lease Campbell Well No. G-18

Location 1320' EWL & 440' SNL, SW¼

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

Elevation, Feet	
Name of Sand	Bartlesville
Top of Core	724.0
Bottom of Core	743.0
Top of Sand	724.0
Bottom of Sand (Tested)	739.0
Total Feet of Permeable Sand	14.5
Total Feet of Floodable Sand	7.5

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	3.0	3.0
27 - 36	3.3	6.3
58 - 88	4.2	10.5
100 - 119	4.0	14.5

Average Permeability Millidarcys	58.3
Average Percent Porosity	18.3
Average Percent Oil Saturation	35.8
Average Percent Water Saturation	48.6
Average Oil Content, Bbls./A. Ft.	508.
Total Oil Content, Bbls./Acre	7,369.
Average Percent Oil Recovery by Laboratory Flooding Tests	5.8
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	87.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	652.
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.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
724.0 - 726.2	Light brown sandstone with shale partings.
726.2 - 727.0	Brown sandstone.
727.0 - 729.0	Gray and brown laminated shale and sandstone.
729.0 - 731.0	Grayish brown shaly sandstone.
731.0 - 733.0	Grayish light brown sandstone.
733.0 - 737.5	Brownish black slightly carbonaceous sandstone with fine shale partings.
737.5 - 738.0	Grayish black slightly carbonaceous shaly sandstone.
738.0 - 739.0	Black slightly carbonaceous sandstone.
739.0 - 743.0	Grayish brown shaly sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 652 barrels of oil per acre was obtained from 7.5 feet of sand. The weighted average percent oil saturation was reduced from 41.2 to 35.4, or represents an average recovery of 5.8 percent. The weighted average effective permeability of the samples is 7.51 millidarcys, while the average initial fluid production pressure is 21.4 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 14 samples tested, 7 produced water and oil, and 6 produced water only. This indicates that approximately 50 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 1,990 barrels of oil per acre. This is an average recovery of 266 barrels per acre foot from 7.5 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	25.0
Average porosity, percent	19.0
Oil saturation after flooding, percent	35.4
Performance factor, percent, estimated	50.0
Net floodable sand, feet	7.5

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Inexco Oil Company Lease Campbell Well No. G-18

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	724.3	18.2	19	58	77	268	87.	1.0	1.0	268	87.00
2	725.3	19.1	32	52	84	474	58.	1.2	2.2	569	69.60
3	726.4	19.9	51	47	98	787	33.	0.8	3.0	630	26.40
4	727.5	19.5	25	55	80	378	28.	1.0	4.0	378	28.00
5	728.6	19.9	21	51	72	324	69.	1.0	5.0	324	69.00
6	729.5	15.4	29	68	97	346	1.6	1.0	6.0	346	1.60
7	730.3	14.6	36	62	98	408	0.87	1.0	7.0	408	0.87
8	731.7	18.9	24	58	82	352	101.	1.0	8.0	352	101.00
9	732.6	20.1	35	45	80	546	110.	1.0	9.0	546	110.00
10	733.4	18.5	49	28	77	703	118.	1.0	10.0	703	118.00
11	734.4	18.0	38	42	80	531	35.	1.5	11.5	797	52.50
12	736.2	17.6	56	35	91	765	8.9	1.0	12.5	765	8.90
13	737.2	19.2	47	36	83	700	101.	1.0	13.5	700	101.00
14	738.2	17.9	42	45	87	583	72.	1.0	14.5	583	72.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Inexco Oil Company Lease Campbell Well No. G-18

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
724.0 - 733.0	9.0	54.8	493.47
733.0 - 737.0	5.5	64.1	352.40
724.0 - 737.0	14.5	58.3	845.87

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
724.0 - 733.0	9.0	18.4	29.8	55.2	425	3,821
733.0 - 737.0	5.5	18.2	45.6	37.6	645	3,548
724.0 - 737.0	14.5	18.3	35.8	48.6	508	7,369

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Inexco Oil Company Lease Campbell Well No. G-18

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.			
1	724.3	18.1	19	267	0	0	19	74	267	442	29.99	10
2	725.3	19.2	32	477	4	60	28	64	417	264	15.24	10
3	726.4	20.0	51	791	15	233	36	62	558	360	18.99	10
4	727.5	19.0	26	383	0	0	26	60	383	216	26.98	10
5	728.6	19.8	21	323	0	0	21	71	323	312	59.97	10
6	729.5	15.5	29	349	0	0	29	69	349	16	0.48	30
7	730.3	14.9	35	405	0	0	35	63	405	8	0.22	40
8	731.7	18.8	24	350	0	0	24	65	350	174	2.55	10
9	732.6	20.2	35	548	5	78	30	59	470	226	16.24	10
10	733.4	18.4	49	699	6	86	43	50	613	54	0.90	30
11	734.4	18.1	38	534	2	28	36	52	506	8	0.22	45
12	736.2	17.9	55	764	0	0	55	36	764	0	Imp.	-
13	737.2	19.3	47	704	6	90	41	47	614	272	4.42	20
14	738.2	18.0	42	587	7	98	35	57	489	62	0.97	25

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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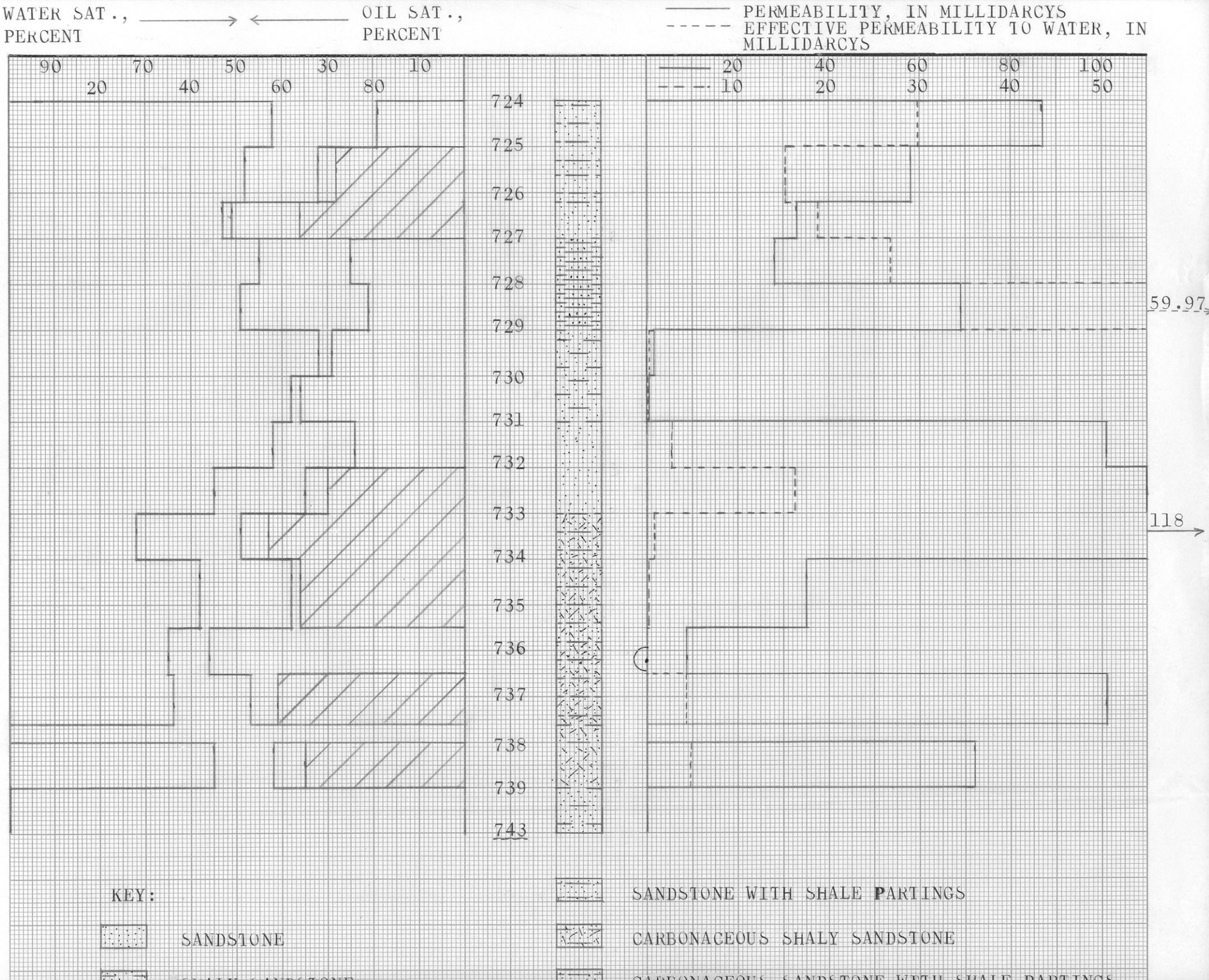
SUMMARY OF LABORATORY FLOODING TESTS

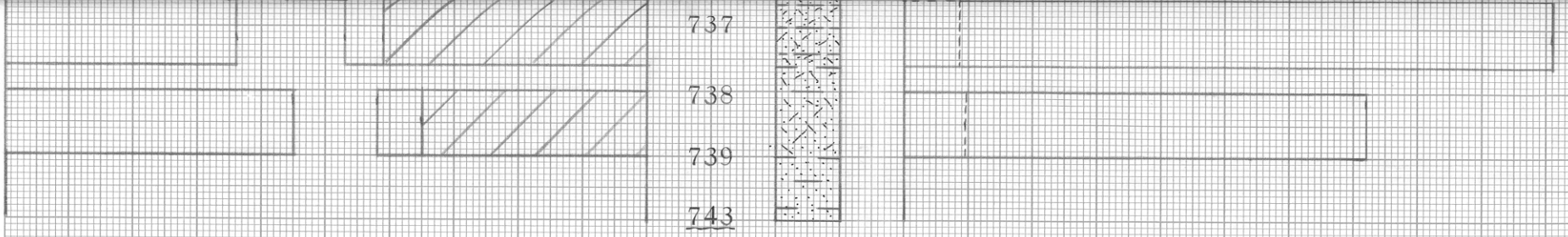
TABLE V

Company Inexco Oil Company Lease Campbell Well No. G-18

Depth Interval, Feet	724.0 - 733.0	733.0 - 739.0	724.0 - 739.0
Feet of Core Analyzed	3.0	4.5	7.5
Average Percent Porosity	19.7	18.4	19.0
Average Percent Original Oil Saturation	38.1	43.3	41.2
Average Percent Oil Recovery	7.3	4.9	5.8
Average Percent Residual Oil Saturation	30.8	38.4	35.4
Average Percent Residual Water Saturation	61.8	51.6	55.7
Average Percent Total Residual Fluid Saturation	92.6	90.0	91.1
Average Original Oil Content, Bbls./A. Ft.	584.	620.	606.
Average Oil Recovery, Bbls./A. Ft.	112.	70.	87.
Average Residual Oil Content, Bbls./A. Ft.	472.	550.	519.
Total Original Oil Content, Bbls./Acre	1,752.	2,791.	4,563.
Total Oil Recovery, Bbls./Acre	336.	316.	652.
Total Residual Oil Content, Bbls./Acre	1,416.	2,475.	3,891.
Average Effective Permeability, Millidarcys	16.57	1.47	7.51
Average Initial Fluid Production Pressure, p.s.i.	10.0	30.0	21.4

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
20 40 60 80 100
10 20 30 40 50
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
743
59.97
118
KEY:
SANDSTONE
SANDSTONE WITH SHALE PARTINGS
CARBONACEOUS SHALY SANDSTONE



KEY:

- SANDSTONE
- SHALY SANDSTONE
- CARBONACEOUS SANDSTONE
- IMPERMEABLE TO WATER
- SANDSTONE WITH SHALE PARTINGS
- CARBONACEOUS SHALY SANDSTONE
- CARBONACEOUS SANDSTONE WITH SHALE PARTINGS
- LAMINATED SANDSTONE AND SHALE
- FLOODPOT RESIDUAL OIL SATURATION

INEXCO OIL COMPANY

CAMPBELL LEASE WELL NO. G-18

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
724.0 - 733.0	9.0	18.4	29.8	55.2	54.8	
733.0 - 737.0	5.5	18.2	45.6	37.6	64.1	
724.0 - 737.0	14.5	18.3	35.8	48.6	58.3	1990 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
DECEMBER, 1981

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