OILFIELD RESEARCH LABORATORIES

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

December 12, 1980

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 Booth Lease, Well No. 16, located in Allen County, Kansas and submitted to our laboratory on October 7, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/mkf

3 c to Moran, Ks.
2 c to Oklahoma City, Okla.

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GENERAL INFORMATION & SUMMARY

Company Inexco Oil Company Lease Booth Well No. 16

Location

Section 18 Twp. ~~[illegible]~~ 25S Rge. ~~[illegible]~~ 21E County Allen State Kansas

Elevation, Feet -

Name of Sand	Bartlesville
Top of Core	751.0
Bottom of Core	772.0
Top of Sand	751.0
Bottom of Sand	772.0
Total Feet of Permeable Sand	21.0
Total Feet of Floodable Sand	5.2

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 50	7.0	7.0
50 - 100	2.1	9.1
100 - 300	9.9	19.0
300 - 500	2.0	21.0

Average Permeability Millidarcys	146.2
Average Percent Porosity	22.5
Average Percent Oil Saturation	52.2
Average Percent Water Saturation	36.0
Average Oil Content, Bbls./A. Ft.	919.
Total Oil Content, Bbls./Acre	19,294.
Average Percent Oil Recovery by Laboratory Flooding Tests	3.8
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	63.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	325.
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. The core was reported to be from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
751.0 - 756.2	Black carbonaceous sandstone.
756.2 - 756.9	Gray slightly carbonaceous sandstone.
756.9 - 772.0	Black carbonaceous sandstone containing a vertical fracture.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 325 barrels of oil per acre was obtained from 5.2 feet of sand. The weighted average percent oil saturation was reduced from 46.2 to 42.4, or represents an average recovery of 3.8 percent. The weighted average effective permeability of the samples is 1.01 millidarcys, while the average initial fluid production pressure is 35.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 21 samples tested, 5 produced water and oil, and 4 samples produced water only. This indicated that approximately 24 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 1220 barrels of oil per acre. This is an average recovery of 234 barrels per acre foot from 5.2 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	25.0
Average porosity, percent	21.3
Oil saturation after flooding, percent	42.4
Performance factor, percent, estimated	50.0
Net floodable sand, feet	5.2

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Inexco Oil Company Lease Booth Well No. 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.		
1	751.5	14.9	49	48	97	566	35.	1.0	1.0	566	35.00
2	752.5	23.7	51	39	90	938	158.	1.0	2.0	938	158.00
3	753.5	22.2	41	40	81	706	130.	1.0	3.0	706	130.00
4	754.5	24.1	54	42	96	1010	305.	1.0	4.0	1010	305.00
5	755.5	21.0	44	43	87	717	241.	1.2	5.2	860	289.20
6	756.5	21.0	29	44	73	473	253.	0.7	5.9	331	177.10
7	757.5	25.6	60	36	96	1192	58.	1.1	7.0	1311	63.80
8	758.5	24.0	46	51	97	856	203.	1.0	8.0	856	203.00
9	759.5	24.4	64	34	98	1230	188.	1.0	9.0	1230	188.00
10	760.5	27.0	62	28	90	1299	437	1.0	10.0	1299	437.00
11	761.5	27.5	58	25	83	1237	273.	1.0	11.0	1237	273.00
12	762.5	24.3	53	15	68	999	253.	1.0	12.0	999	253.00
13	763.5	22.6	68	30	98	1192	183.	1.0	13.0	1192	182.00
14	764.5	18.1	57	37	94	800	84.	1.0	14.0	800	84.00
15	765.5	27.0	53	38	91	1110	32.	1.0	15.0	1110	32.00
16	766.5	25.3	46	45	91	903	41.	1.0	16.0	903	41.00
17	767.5	22.1	41	39	80	703	137.	1.0	17.0	703	137.00
18	768.5	17.3	38	40	78	510	26.	1.0	18.0	510	26.00
19	769.5	19.7	54	35	89	825	26.	1.0	19.0	825	26.00
20	770.5	21.4	64	24	88	1063	17.	1.0	20.0	1063	17.00
21	771.5	19.1	57	23	80	845	13.	1.0	21.0	845	13.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Inexco Oil Company Lease Booth Well No. 16

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
751.0 - 759.0	8.0	170.1	1361.10
759.0 - 772.0	13.0	131.5	1709.00
751.0 - 772.0	21.0	146.2	3070.10

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
751.0 - 759.0	8.0	22.1	47.5	42.8	822	6,578
759.0 - 772.0	13.0	22.8	55.0	31.8	978	12,716
751.0 - 772.0	21.0	22.5	52.2	36.0	919	19,294

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Inexco Oil Company Lease Booth Well No. 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.			
											97	
1	751.5	15.0	49	570	4	47	45	52	523	55	0.30	30
2	752.5	23.5	51	930	5	91	46	51	839	53	0.67	30
3	753.5	22.3	41	709	3	52	38	52	657	12	0.22	45
4	754.5	24.1	54	1010	0	0	54	42	1010	439	5.70	20
5	755.5	21.3	44	727	3	50	41	54	677	132	2.70	25
6	756.5	20.6	30	479	0	0	30	45	479	0	Imp.	-
7	757.5	25.1	61	1188	0	0	61	35	1188	0	Imp.	-
8	758.5	24.1	46	860	4	75	42	54	785	9	0.15	45
9	759.5	24.9	63	1217	0	0	63	35	1217	0	Imp.	-
10	760.5	27.0	62	1299	0	0	62	29	1299	0	Imp.	-
11	761.5	27.4	58	1233	0	0	58	37	1233	18	0.67	50
12	762.5	23.8	54	997	0	0	54	16	997	0	Imp.	-
13	763.5	22.5	68	1187	0	0	68	30	1187	0	Imp.	-
14	764.5	18.3	57	809	0	0	57	38	809	0	Imp.	-
15	765.5	27.0	53	1110	0	0	53	40	1110	0	Imp.	-
16	766.5	24.8	47	904	0	0	47	46	904	0	Imp.	-
17	767.5	22.2	41	706	0	0	41	39	706	0	Imp.	-
18	768.5	17.5	38	516	0	0	38	43	516	0	Imp.	-
19	769.5	20.1	53	826	0	0	53	37	826	0	Imp.	-
20	770.5	21.5	64	1068	0	0	64	25	1068	0	Imp.	-
21	771.5	19.0	57	840	0	0	57	25	840	36	0.45	50

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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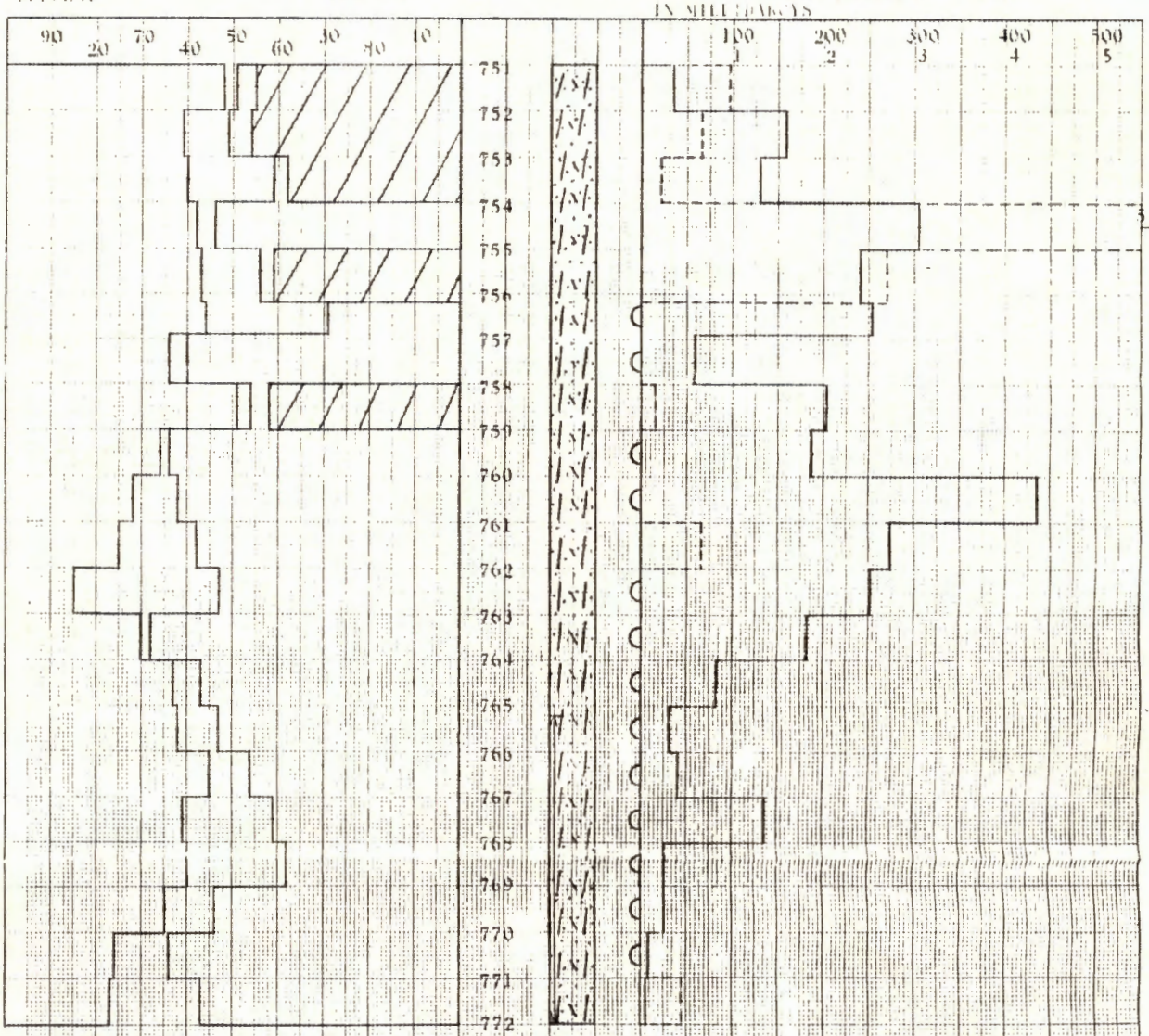
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Inexco Oil Company Lease Booth Well No. 16

Depth Interval, Feet	751.0 - 759.0
Feet of Core Analyzed	5.2
Average Percent Porosity	21.3
Average Percent Original Oil Saturation	46.2
Average Percent Oil Recovery	3.8
Average Percent Residual Oil Saturation	42.4
Average Percent Residual Water Saturation	52.7
Average Percent Total Residual Fluid Saturation	95.1
Average Original Oil Content, Bbls./A. Ft.	758.
Average Oil Recovery, Bbls./A. Ft.	63.
Average Residual Oil Content, Bbls./A. Ft.	695.
Total Original Oil Content, Bbls./Acre	3,941.
Total Oil Recovery, Bbls./Acre	325.
Total Residual Oil Content, Bbls./Acre	3,616.
Average Effective Permeability, Millidarcys	1.01
Average Initial Fluid Production Pressure, p.s.i.	35.

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



KEY:

- CARBONACEOUS SANDSTONE
- FLOODPOT RESIDUAL OIL SATURATION
- IMPERMEABLE TO WATER
- CARBONACEOUS SANDSTONE w/vertical fracture

INEXCO OIL COMPANY

BOOTH LEASE — WELL NO. 16

ALLEN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY PERCENT	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY MILLIDARCYS	CALCULATED OIL RECOVERY BBLS./ACRE
751.0 - 759.0	8.0	22.1	47.5	42.8	170.1	
759.0 - 772.0	13.0	22.8	55.0	31.8	131.5	
751.0 - 772.0	21.0	22.5	52.2	36.0	146.2	1,220 (PRIMARY & WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
DECEMBER, 1960

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