



OILFIELD RESEARCH LABORATORIES

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September 11, 1979

Layton Oil Company
P.O. Box 263
Independence, Kansas 67301

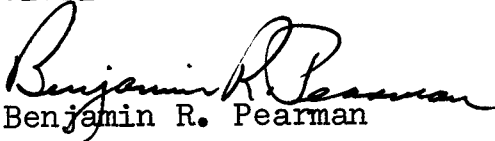
Gentlemen:

Enclosed herewith is the report of the analysis of the Bartlesville rotary core samples and Burgess rotary core, taken from the Fobian Lease, Well No. F-12, Montgomery County, Kansas, and submitted to our laboratory on September 1, 1979. In analyzing the Bartlesville section, it is assumed that each sample represents one foot of core.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Benjamin R. Pearman

BRP:km
5 c to Independence, Kansas

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GENERAL INFORMATION & SUMMARY

Company Layton Oil Company Lease Fobian Well No. F-12

Location 1046' NSL & 220' WEL NW

Section 5 Twp 35S Rge. 14E County Montgomery State Kansas

Name of Sand	Bartlesville
Top of Core	1315.0
Bottom of Core	1328.5
Top of Sand	1315.0
Bottom of Sand	1328.5
Total Feet of Permeable Sand	7.0
Total Feet of Floodable Sand	2.0

Distribution of Permeable Sand:
Permeability Range
Millidarcys

	Feet	Cum. Ft.
0 - 1.0	1.0	1.0
1.0 - 5	3.0	4.0
5 - 10	3.0	7.0

Average Permeability Millidarcys	4.7
Average Percent Porosity	14.7
Average Percent Oil Saturation	23.0
Average Percent Water Saturation	53.9
Average Oil Content, Bbls./A. Ft.	267.
Total Oil Content, Bbls./Acre	2,671.
Average Percent Oil Recovery by Laboratory Flooding Tests	11.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	136.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	271.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

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GENERAL INFORMATION & SUMMARY

Company Layton Oil Company Lease Fobian Well No F-12
 Location 1046' NSL & 220' WEL NW
 Section 5 Twp. 35S Rge. 14E County Montgomery State Kansas

Name of Sand	-	Burgess
Top of Core	-	1508.0
Bottom of Core	-	1536.0
Top of Sand	-	1508.0
Bottom of Sand	-	1535.6
Total Feet of Permeable Sand	(Tested)	16.5
Total Feet of Floodable Sand	(Analyzed)	7.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
12 - 28	3.7	3.7
90 - 95	2.0	5.7
250 - 500	4.0	9.7
500 & Above	6.8	16.5

Average Permeability Millidarcys	-	442.1
Average Percent Porosity	-	18.1
Average Percent Oil Saturation	-	16.1
Average Percent Water Saturation	-	46.8
Average Oil Content, Bbls./A. Ft.	-	228.
Total Oil Content, Bbls./Acre	-	3,778.
Average Percent Oil Recovery by Laboratory Flooding Tests	-	2.7
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	-	38.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	-	269.
Total Calculated Oil Recovery, Bbls./Acre	-	See "Calculated Recovery" Section
Packer Setting, Feet	-	
Viscosity, Centipoises @	-	
A. P. I. Gravity, degrees @ 60 °F	-	
Elevation, Feet	-	

Fresh water mud was used as the circulating fluid while taking these cores. The cores were 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>
<u>BARTLESVILLE SAND</u>	
1315.0 - 1316.0	Light brown and gray laminated sandstone and shale.
1316.0 - 1319.0	Dark brown slightly shaly sandstone.
1319.0 - 1321.0	Dark brown sandstone containing thin shale partings.
1321.0 - 1328.5	Gray and light brown laminated shale and sandstone.
<u>BURGESS SAND</u>	
1508.0 - 1521.0	Light brown sandstone containing widely scattered shale laminations.
1521.0 - 1521.3	Gray sandy shale.
1521.3 - 1521.4	Light brown sandstone containing thin shale partings.
1521.4 - 1526.0	Brown sandstone.
1526.0 - 1527.1	Light brown sandstone containing thin closely spaced micaceous partings.
1527.1 - 1531.9	Brown sandstone.
1531.9 - 1532.2	Gray barren sandstone.
1532.2 - 1534.0	Light brown sandstone containing thin micaceous partings.
1534.0 - 1535.6	Light brown sandstone.
1535.6 - 1536.0	Gray barren sandstone.

LABORATORY FLOODING TESTS

The sand in these cores responded to laboratory flooding tests. A total recovery of 136 and 269 barrels of oil per acre was obtained from 2.0 and 7.0 feet of sand from the Bartlesville and Burgess Sands respectively. The weighted average percent oil saturations were reduced from 34.5 to 23.5 and 23.9 to 21.2, or represents average recoveries of 11.0 and 2.7 percent respectively. The weighted average effective permeabilities of the samples are 0.15 and 48.74 millidarcys, while the average initial fluid production pressures are 45.0 and 10.0 pounds per square inch (See Table V).

CALCULATED RECOVERY

The results of the laboratory tests indicate that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 300 and 2,250 barrels of oil per acre respectively from the Bartlesville and Burgess reservoirs represented by these cores. These are average recoveries of 146 and 322 barrels per acre foot from the 2.0 feet and 7.0 feet of floodable sand analyzed in these cores.

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

	<u>Bartlesville</u>	<u>Burgess</u>
Original formation volume factor	1.10	1.12
Reservoir water saturation, percent	45.0	25.0
Average porosity, percent	15.8	18.2
Oil saturation after flooding, percent	23.5	21.2
Performance factor, percent	45.0	50.0
Net floodable pay sand, feet	2.0	7.0

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Layton Oil Company Lease Fobian Well No. F-12

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.		
<u>BARTLESVILLE SAND</u>										
1	1315.5	14.4	27	57	84	302	1.0	1.0	302	1.70
2	1316.5	15.1	30	55	85	351	1.0	2.0	351	7.30
3	1317.5	15.7	39	46	85	475	1.0	3.0	475	9.30
4	1318.5	17.3	25	53	78	336	1.0	4.0	336	5.80
5	1319.5	14.8	24	60	84	276	1.0	5.0	276	3.70
6	1320.5	12.7	20	61	81	197	1.0	6.0	197	4.70
7	1321.5	16.4	21	50	71	267	1.0	7.0	267	0.00
8	1322.5	14.1	23	47	70	252	1.0	8.0	252	0.70
9	1324.5	13.5	15	52	67	157	1.0	9.0	157	0.00
10	1328.0	12.5	6	58	64	58	1.0	10.0	58	0.00
<u>BURGESS SAND</u>										
1	1508.5	16.7	1	41	42	13	1.0	1.0	13	94.00
2	1512.5	19.0	11	44	55	162	1.0	2.0	162	253.00
3	1516.5	15.6	12	53	65	145	1.0	3.0	145	28.00
4	1520.5	16.4	13	43	56	165	1.0	4.0	165	20.00
5	1521.5	15.3	28	43	71	332	0.6	4.6	199	9.60
6	1522.5	19.3	26	26	52	389	1.0	5.6	389	874.00
7	1523.5	18.5	22	33	55	316	1.0	6.6	316	478.00
8	1524.5	19.5	19	36	55	287	1.0	7.6	287	1092.00
9	1525.5	17.7	24	39	63	330	1.0	8.6	330	91.00
10	1526.5	14.9	24	40	64	277	1.1	9.7	304	13.20
11	1527.5	19.7	11	41	52	168	0.9	10.6	151	775.80
12	1528.5	18.3	17	44	61	241	1.0	11.6	241	753.00
13	1529.5	18.6	25	41	66	361	1.0	12.6	361	611.00
14	1530.5	17.6	26	42	68	355	1.0	13.6	355	500.00
15	1531.5	19.1	20	51	71	296	0.9	14.5	266	572.40

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Layton Oil Company Lease Fobian Well No. F-12

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.		
16	1532.5	19.9	3	86	89	<u>BURGESS SAND</u>	436.	1.0	46	436.00	
17	1535.5	20.7	3	90	93		694.	1.0	48	694.00	
V-1	1531.6					<u>VERTICAL PERMEABILITY</u>	566.				
V-2	1532.1						189.				
V-3	1537.7						415.				

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Layton Oil Company	Lease	Fobian	Well No.	F-12	
Depth Interval, Feet	Feet of Core Analyzed	Average Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
<u>BARTLESVILLE SAND</u>						
1315.0 - 1321.0	6.0	15.0	27.5	55.4	323	1,937
1321.0 - 1328.5	1.0	14.1	16.3	51.8	184	734
1315.0 - 1328.5	7.0	14.7	23.0	53.9	267	2,671

Permeability Capacity Ft. x Md.

Average Permeability, Millidarcys

Feet of Core Analyzed

Depth Interval, Feet

Total Oil Content Bbls./Acre

Average Oil Content Bbl./A. Ft.

Average Percent Water Saturation

Average Percent Oil Saturation

Average Porosity

Feet of Core Analyzed

Depth Interval, Feet

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Lease	Fobian	Well No.
Layton Oil Company	<u>BARTLESVILLE</u>		<u>BURGESS</u>
	1315.0 - 1328.5		1520.0 - 1533.2
Feet of Core Analyzed	2.0		7.0
Average Percent Porosity	15.8		18.2
Average Percent Original Oil Saturation	34.5		23.9
Average Percent Oil Recovery	11.0		2.7
Average Percent Residual Oil Saturation	23.5		21.2
Average Percent Residual Water Saturation	70.0		70.3
Average Percent Total Residual Fluid Saturation	93.5		91.5
Average Original Oil Content, Bbls./A. Ft.	424.		337.
Average Oil Recovery, Bbls./A. Ft.	136.		38.
Average Residual Oil Content, Bbls./A. Ft.	288.		299.
Total Original Oil Content, Bbls./Acre	847.		2,362.
Total Oil Recovery, Bbls./Acre	271.		269.
Total Residual Oil Content, Bbls./Acre	576.		2,093.
Average Effective Permeability, Millidarcys	0.15		48.74
Average Initial Fluid Production Pressure, p.s.i.	45.0		10.0

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