November 20, 1952

3-35-15E

Emery Construction Company, Inc.
P. O. Box 498
Topeka, Kansas

Attention: Mr. George B. Emery, Jr.

Gentlemen:

Enclosed herewith is the report of the analysis of the 3" Rotary core taken from the Hodges Lease, Well No. 1, Montgomery County, Kansas, and submitted to our laboratory on November 1, 1952.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. Pate

CLP:bl
c.c. to Mr. E. A. Whitworth
Coffeyville, Kansas

Hodges 1

EMERY CONSTRUCTION COMPANY, INC.

CORE ANALYSIS REPORT

HODGES LEASE WELL NO. 1

MONTGOMERY COUNTY, KANSAS

OILFIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

NOVEMBER 20, 1953

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Emery Construction Co., Inc. Lease Hodges Well No. 1

Location NE¼, NW¼

Section 3 Twp. 35S Rge. 15E County Montgomery State Kansas

Name of Sand	Bartlesville
Top of Core	1170.00
Bottom of Core	1227.00
Top of Pay Sand (Approximate)	1183.30
Bottom of Sand	1207.38
Total Feet of Permeable Sand (Analyzed)	27.05
Total Feet of Floodable Sand (Analyzed)	6.94

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 2	4.48	4.48
2 - 4	6.99	11.47
4 - 8	5.96	17.43
8 - 16	5.42	22.85
16 - 32	2.45	25.30
32 - 48	1.05	26.35
48 & above	0.70	27.05

Average Permeability Millidarcys	9.96
Average Percent Porosity	17.24
Average Percent Oil Saturation	29.65
Average Percent Water Saturation	49.80
Average Oil Content, Bbls./A. Ft.	399.
Total Oil Content, Bbls./Acre	10,287.
Average Percent Oil Recovery by Laboratory Flooding Tests	5.78
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	82.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	571.
Total Calculated Oil Recovery, Bbls./Acre	700.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

Fresh water was used as a circulating fluid in the coring of the sand in this well.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
1170.00 - 1170.15	Gray shale.
1170.15 - 1170.35	Light brown fine grained micaceous sandstone.
1170.35 - 1172.00	Laminated sandy shale.
1172.00 - 1172.30	Laminated shaley sandstone.
1172.30 - 1173.00	Light brown fine grained micaceous sandstone.
1173.00 - 1173.90	Hard light brown calcareous sandstone.
1173.90 - 1177.30	Light brown fine grained micaceous sandstone.
1177.30 - 1177.50	Light brown fine grained laminated micaceous shaley sandstone.
1177.50 - 1177.80	Light brown fine grained micaceous sandstone.
1177.80 - 1178.35	Light brown fine grained laminated micaceous shaley sandstone.
1178.35 - 1179.00	Light brown fine grained micaceous sandstone.
1179.00 - 1180.05	Light brown fine grained laminated micaceous shaley sandstone.
1180.05 - 1181.30	Light brown fine grained slightly laminated micaceous shaley sandstone.
1181.30 - 1182.70	Light brown fine grained micaceous sandstone.
1182.70 - 1183.30	Loss.
1183.30 - 1183.50	Light brown fine grained micaceous sandstone.
1183.50 - 1184.50	Loss.
1184.50 - 1184.90	Light brown fine grained micaceous sandstone.
1184.90 - 1185.70	Loss.
1185.70 - 1186.00	Light brown fine grained micaceous sandstone.

1186.00 - 1186.50 - Loss.

1186.50 - 1186.95 - Light brown fine grained micaceous sandstone.

1186.95 - 1187.90 - Loss.

1187.90 - 1188.45 - Light brown fine grained micaceous sandstone.

1188.45 - 1189.10 - Loss.

1189.10 - 1191.20 - Light brown fine grained micaceous sandstone.

1191.20 - 1192.00 - Laminated sandy shale.

1192.00 - 1192.40 - Laminated shaley sandstone.

1192.40 - 1192.65 - Laminated sandstone and shale.

1192.65 - 1192.85 - Light brown fine grained laminated micaceous shaley sandstone.

1192.85 - 1193.10 - Laminated sandstone and shale.

1193.10 - 1193.60 - Light brown fine grained laminated micaceous shaley sandstone.

1193.60 - 1194.20 - Brown fine grained micaceous sandstone.

1194.20 - 1194.40 - Light brown fine grained laminated micaceous shaley sandstone.

1194.40 - 1195.35 - Light brown fine grained micaceous slightly shaley sandstone.

1195.35 - 1195.85 - Brown fine grained micaceous sandstone containing a shale break.

1195.85 - 1196.33 - Laminated sandy shale.

1196.33 - 1196.86 - Light brown to brown fine grained micaceous sandstone.

1196.86 - 1197.35 - Gray sandy shale.

1197.35 - 1198.78 - Brown fine grained micaceous shaley sandstone.

1198.78 - 1199.10 - Laminated sandy shale.

1199.10 - 1200.05 - Brown fine grained micaceous sandstone.

1200.05 - 1200.33 - Brown fine grained laminated micaceous shaley sandstone.

1200.33 - 1201.20 - Brown fine grained micaceous sandstone.

1201.20 - 1201.65 - Light brown fine grained micaceous sandstone.

1201.65 - 1202.40 - Laminated sandy shale.

1202.40 - 1202.95 - Gray laminated shaley sandstone.

1202.95 - 1203.75 - Laminated sandy shale.

1203.75 - 1204.50 - Brown fine grained micaceous slightly shaley sandstone.

1204.50 - 1205.10 - Brown fine grained micaceous sandstone.

1205.10 - 1205.22 - Finely laminated sandy shale.

1205.22 - 1205.72 - Brown fine grained micaceous sandstone.

1205.72 - 1206.24 - Gray sandy shale.

1206.24 - 1207.38 - Brown fine grained micaceous sandstone.

1207.38 - 1213.80 - Gray sandy shale.

1213.80 - 1214.58 - Light brown fine grained micaceous slightly calcareous sandstone.

1214.58 - 1214.85 - Gray sandy shale.

1214.85 - 1215.50 - Grayish light brown shaley sandstone.

1215.50 - 1216.45 - Gray sandy shale.

1216.45 - 1217.80 - Light brown fine grained micaceous sandstone.

1217.80 - 1218.20 - Light brown fine grained micaceous shaley sandstone.

1218.20 - 1221.00 - Laminated sandy shale.

1221.00 - 1222.40 - Gray sandy shale.

1222.40 - 1222.65 - Light brown fine grained micaceous shaley sandstone.

1222.65 - 1225.55 - Gray sandy shale.

1225.55 - 1226.00 - Light brown fine grained micaceous sandstone.

1226.00 - 1226.50 - Hard light brown fine grained micaceous calcareous sandstone.

1226.50 - 1227.00 - Loss.

Coring was started at a depth of 1170.00 feet in gray shale and completed at 1227.00 feet, probably in sandstone. There was a loss at the

bottom of the core extending from 1226.50 to 1227.00 feet. This core shows a total of 29.42 feet of sandstone. For the most part, the pay is made up of fine grained micaceous to shaley sandstone. There were a number of losses that were probably sandstone. The cored section is badly broken by layers of sandy shale.

PERMEABILITY

For the sake of distribution, the core was divided into three sections. The weighted average permeability of the upper, middle and lower sections is 8.12 20.09 and 5.15 millidarcys respectively; the overall average being 9.96 (See Table II). By observing the data given on the coregraph, it is noticeable that the sand has a wide variation in permeability and, for the most part, is very tight. The permeability of the sand varies from impermeable to a maximum of 129 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a fair weighted average percent oil saturation, namely, 29.65. The weighted average percent oil saturation of the upper, middle and lower sections is 29.80, 30.66 and 28.87 respectively. The weighted average percent water saturation of the upper, middle and lower sections is 47.85, 57.21 and 46.78 respectively; the overall average being 49.80 (See Table IV). This gives an overall weighted average total fluid saturation of 79.45 percent. This fairly low total fluid saturation indicates that an appreciable amount of fluid was lost during coring which was probably oil.

In an effort to determine the degree of flushing of the sand during coring, all of the saturation samples were analyzed for chloride content. The results of these tests are given in Tables VII and VIII. From the

data given in these tables and on the coregraph, it is evident that considerable flushing of the sand did occur during coring as, for the more part, the zones of higher permeability have a much lower chloride content.

The weighted average oil content of the upper, middle and lower sections is 386, 444 and 382 barrels per acre foot respectively; the overall average being 399. The total oil content, as shown by this core, is 10,287 barrels per acre (See Table IV).

LABORATORY FLOODING TESTS

The sand in this core did not respond very well to laboratory flooding tests, as a total recovery of only 571 barrels of oil per acre was obtained from 6.94 feet of sand. The weighted average percent oil saturation was reduced from 33.47 to 27.69 or represents an average recovery of 5.78 percent. The weighted average effective permeability of the samples is 1.29 millidarcys, while the average initial fluid production pressure is 32.7 pounds per square inch (See Table VI).

By observing the data given in Table V, you will note that of the 36 samples tested, 20 produced water and 11 oil. This indicates that only 31 percent of the sand represented by these samples is floodable pay sand. The tests also show that the sand has a wide variation in effective permeability and, for the most part, is very tight.

CONCLUSION

On the basis of the above data, it is evident that an efficient water flood within the vicinity of this well will recover approximately 700 barrels of oil per acre, or an average of 101 barrels per acre foot from the 6.94 feet of floodable pay sand analyzed. In calculating this

recovery, an allowance was made for oil lost during coring, and it is assumed that the primary production and the true water saturation of the sand are 10 and 38 percent respectively.

The principle drawback of this core is the fact that it shows a thin floodable sand section. Furthermore, the sand is very tight and has a wide variation in permeability.

Oilfield Research Laboratories

RESULTS OF PERMEABILITY TESTS

TABLE I

Company Emery Construction Co., Inc. Lease Hodges Well No. 1

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	1172.35	4.9	0.30	0.30	1.47
2	1172.80	7.2	0.40	0.70	2.88
3	1173.94	12.	0.30	1.00	3.60
4	1174.39	16.	0.50	1.50	8.00
5	1174.95	9.8	0.50	2.00	4.90
6	1175.40	16.	0.50	2.50	8.00
7	1176.00	13.	0.55	3.05	7.15
8	1176.55	19.	0.45	3.50	8.55
9	1176.95	4.3	0.60	4.10	2.58
10	1177.45	1.4	0.20	4.30	0.28
11	1177.85	1.2	0.30	4.60	0.36
12	1178.25	1.2	0.25	4.85	0.30
13	1178.65	2.7	0.65	5.50	1.76
14	1179.25	0.47	0.40	5.90	0.19
15	1179.55	Imp.	0.35	6.25	0.00
16	1180.00	0.52	0.30	6.55	0.16
17	1180.35	7.2	0.55	7.10	3.96
18	1180.85	2.2	0.40	7.50	0.88
19	1181.20	3.4	0.30	7.80	1.02
20	1181.85	7.0	0.70	8.50	4.90
21	1182.25	13.	0.40	8.90	5.20
22	1182.65	19.	0.30	9.20	5.70
23	1184.76	52.	0.40	9.60	20.80
24	1185.95	20.	0.30	9.90	6.00
25	1186.89	47.	0.45	10.35	21.15
26	1188.17	15.	0.55	10.90	8.25
27	1189.77	2.0	0.80	11.70	1.60
28	1190.20	5.4	0.45	12.15	2.43
29	1190.55	9.5	0.45	12.60	4.28
30	1191.05	16.	0.40	13.00	6.40
31	1192.10	0.51	0.40	13.40	0.20
32	1192.75	0.79	0.20	13.60	0.16
33	1193.25	0.42	0.50	14.10	0.21
34	1194.10	45.	0.60	14.70	27.00
35	1194.45	0.53	0.30	15.00	0.16
36	1194.95	3.3	0.65	15.65	2.15
37	1195.45	129.	0.30	15.95	38.70
38	1195.82	5.7	0.20	16.15	1.14
39	1196.35	9.3	0.22	16.37	2.05
40	1196.67	3.8	0.31	16.68	1.18

Oilfield Research Laboratories

RESULTS OF PERMEABILITY TESTS

TABLE I

Company Emery Construction Co., Inc. Lease Hodges Well No. 1

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
41	1197.45	9.5	0.45	17.13	4.28
42	1198.05	10.	0.45	17.58	4.50
43	1198.40	3.9	0.30	17.88	1.17
44	1198.75	2.0	0.23	18.11	0.46
45	1199.25	9.2	0.35	18.46	3.22
46	1199.75	9.4	0.60	19.06	5.64
47	1200.35	6.7	0.27	19.33	1.81
48	1200.75	3.8	0.30	19.63	1.14
49	1201.12	5.2	0.30	19.93	1.56
50	1201.45	3.7	0.45	20.38	1.67
21	1202.45	4.7	0.55	20.93	2.59
52	1203.90	3.3	0.45	21.38	1.49
53	1204.45	3.7	0.30	21.68	1.11
54	1204.90	12.	0.60	22.28	7.20
55	1205.25	6.7	0.23	22.51	1.54
56	1205.62	4.4	0.27	22.78	1.19
57	1206.40	6.1	0.46	23.24	2.81
58	1207.08	5.8	0.68	23.92	3.94
59	1214.12	1.3	0.50	24.42	0.65
60	1214.46	1.4	0.28	24.70	0.39
61	1216.75	3.4	0.50	25.20	1.70
62	1217.20	3.4	0.40	25.60	1.36
63	1217.55	2.2	0.45	26.05	0.99
64	1218.12	0.73	0.40	26.45	0.29
65	1225.80	1.6	0.45	26.90	0.72
66	1226.20	2.5	0.50	27.40	1.25

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SUMMARY OF PERMEABILITY TESTS

TABLE II

Company Emery Construction Co., Inc Lease Hodges Well No. 1

Depth Interval Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.
1172.30 - 1182.70	8.85	8.12	71.84
1184.50 - 1195.85	6.95	20.09	139.63
1196.33 - 1226.50	11.25	5.15	57.90
1172.30 - 1226.50	27.05	9.96	269.37

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RESULTS OF SATURATION TESTS

TABLE III

Company Emery Construction Company, Inc. Lease Hodges Well No. 1

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
1	1172.55	18.6	24.8	39.5	64.3	358	0.70	0.70	251
2	1174.15	18.8	29.4	40.3	69.7	429	0.70	1.40	300
3	1175.15	17.2	20.2	47.2	67.4	270	1.35	2.75	364
4	1176.75	15.7	28.0	54.3	82.3	342	1.35	4.10	462
5	1177.65	17.2	29.2	44.3	73.5	390	0.30	4.40	117
6	1178.50	16.5	45.1	44.4	89.5	578	0.65	5.05	376
7	1179.40	15.1	31.0	50.0	81.0	364	1.05	6.10	382
8	1180.16	15.2	36.0	46.7	82.7	425	0.55	6.65	234
9	1181.00	16.4	42.7	48.2	90.9	545	0.70	7.35	382
10	1182.10	16.8	26.9	50.0	76.9	351	1.40	8.75	492
11	1183.40	20.6	28.6	57.6	86.2	456	0.20	8.95	91
12	1184.60	19.5	30.0	55.1	85.1	455	0.40	9.35	182
13	1185.80	19.7	33.7	54.4	88.1	516	0.30	9.65	155
14	1186.60	19.1	35.7	56.5	92.2	530	0.45	10.10	238
15	1188.00	19.1	34.2	61.2	95.4	507	0.55	10.65	279
16	1189.20	19.2	24.2	67.2	91.4	360	0.50	11.15	180
17	1190.00	18.2	20.5	57.3	77.8	290	0.75	11.90	218
18	1190.80	19.0	35.8	56.7	82.5	528	0.85	12.75	449

Oilfield Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company Emery Construction Company, Inc. Lease Hodges Well No. 1

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
19	1193.45	15.1	21.1	69.6	90.7	248	0.50	13.25	124
20	1193.75	20.0	34.7	43.4	78.1	540	0.60	13.85	324
21	1194.30	16.6	36.0	62.1	98.1	464	0.20	14.05	93
22	1195.17	17.3	33.0	58.0	91.0	444	0.95	15.00	422
23	1195.62	19.6	31.8	49.3	81.1	484	0.50	15.50	242
24	1196.50	18.8	43.9	51.6	95.5	640	0.53	16.03	339
25	1197.85	18.0	27.2	41.9	69.1	380	0.85	16.88	323
26	1198.55	16.9	34.2	58.4	92.6	449	0.58	17.46	260
27	1199.60	16.3	34.5	59.2	93.7	437	0.95	18.41	415
28	1200.55	16.8	21.0	44.3	65.3	274	0.87	19.28	238
29	1201.30	17.4	22.2	45.1	67.3	300	0.45	19.73	135
30	1204.64	17.9	34.3	40.0	74.3	477	1.35	21.08	645
31	1205.45	18.5	35.2	45.8	81.0	506	0.50	21.58	253
32	1206.80	17.5	31.6	43.8	75.4	430	1.14	22.72	490
33	1214.30	15.9	16.0	56.3	72.3	197	0.78	23.50	154
34	1216.97	16.3	26.4	45.2	71.6	334	1.35	24.85	451
35	1225.65	14.4	26.2	40.9	67.1	294	0.45	25.30	132
36	1226.35	12.2	20.2	39.1	59.3	190	0.50	25.80	95
							Total	- - - - -	10,287

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SUMMARY OF SATURATION TESTS

TABLE IV

Company Emery Construction Company, Inc. Lease Hodges Well No. 1

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbls./A. Ft.	Total Oil Content Bbls./Acre
1172.30 - 1183.50	8.95	16.76	29.80	47.85	386	3,451
1184.50 - 1195.85	6.55	18.52	30.66	57.21	444	2,906
1196.33 - 1226.50	10.30	16.84	28.87	46.78	382	3,930
1172.30 - 1226.50	25.80	17.24	29.65	49.80	399	10,287

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company Emery Construction Company, Inc. Lease Hodges Well No. 1

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.
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	1172.55	18.5	23.9	343	0.0	0	23.9	57.8	343	2	0.098	40
2	1174.15	18.4	27.5	393	0.0	0	27.5	57.8	393	10	0.298	30
3	1175.15	17.4	19.2	260	0.0	0	19.2	63.5	260	12	0.445	30
4	1176.75	16.0	29.0	360	0.0	0	29.0	68.1	360	8	0.283	35
5	1177.65	17.6	27.5	376	0.0	0	27.5	64.0	376	0	Imp.	50#
6	1178.50	16.3	43.4	549	0.0	0	43.4	48.3	549	0	Imp.	50#
7	1179.40	15.1	29.6	347	0.0	0	29.6	65.3	347	0	Imp.	50#
8	1180.16	15.6	34.8	421	0.0	0	34.8	50.0	421	0	Imp.	50#
9	1181.00	16.0	41.5	516	0.0	0	41.5	53.1	516	0	Imp.	50#
10	1182.10	16.9	28.5	374	0.0	0	28.5	60.1	374	0	Imp.	50#
11	1183.40	20.9	28.6	465	5.2	85	23.4	70.7	380	141	5.32	15
12	1184.60	19.7	30.0	459	3.0	46	27.0	65.9	413	15	0.428	30
13	1185.80	19.3	33.7	506	7.2	108	26.5	69.6	398	58	1.73	25
14	1186.60	18.7	35.7	518	8.3	120	27.4	70.5	398	25	0.692	25
15	1188.00	19.2	34.2	510	7.4	110	26.8	67.0	400	17	0.474	30
16	1189.20	19.2	23.3	347	0.0	0	23.3	71.6	347	18	0.462	25
17	1190.00	17.8	21.6	309	0.0	0	21.6	71.6	309	0	Imp.	50#
18	1190.80	19.0	34.0	502	0.0	0	34.0	62.0	502	4	0.155	35
19	1193.45	15.3	20.3	241	0.0	0	20.3	70.7	241	0	Imp.	50#
20	1193.75	20.1	34.7	542	8.7	136	26.0	70.7	406	117	3.99	20
21	1194.30	16.3	34.4	436	0.0	0	34.4	64.3	436	0	Imp.	50#
22	1195.17	17.3	31.4	422	0.0	0	31.4	61.6	422	0	Imp.	50#
23	1195.62	20.0	31.8	494	7.1	110	24.7	66.5	384	158	7.25	15
24	1196.50	18.3	42.5	604	0.0	0	42.5	53.3	604	0	Imp.	50#
25	1197.85	17.9	25.2	350	0.0	0	25.2	65.0	350	0	Imp.	50#
26	1198.55	16.6	34.9	450	0.0	0	34.9	60.3	450	0	Imp.	50#
27	1199.60	16.4	34.5	349	2.7	34	31.8	64.8	405	10	0.193	50
28	1200.55	16.4	22.7	289	0.0	0	22.7	54.5	289	6	0.099	50
29	1201.30	17.1	22.0	292	0.0	0	22.0	56.4	292	2	0.048	50
30	1204.64	17.5	34.3	466	7.0	95	27.3	67.0	371	7	0.087	50

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company Emery Construction Company, Inc. Lease Hodges Well No. 1

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.
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
31	1205.45	18.1	35.2	492	5.4	76	29.8	62.0	416	3	0.100	50
32	1206.80	17.3	31.6	424	3.8	51	27.8	61.0	373	9	0.245	50
33	1214.30	15.9	14.4	178	0.0	0	14.4	58.4	178	0	Imp.	50#
34	1216.97	16.2	24.8	312	0.0	0	24.8	63.5	312	3	0.092	50
35	1225.65	13.9	25.0	270	0.0	0	25.0	51.4	270	0	Imp.	50#
36	1226.35	12.4	18.9	182	0.0	0	18.9	46.8	182	0	Imp.	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 VI

Company Emery Construction Company, Inc. Lease Hodges Well No. 1

Depth Interval, Feet	1183.30 - 1195.85	1199.10 - 1207.38	1183.30 - 1207.38
Feet of Core Analyzed	3.00	3.94	6.94
Average Percent Porosity	19.67	17.26	18.30
Average Percent Original Oil Saturation	33.20	33.68	33.47
Average Percent Oil Recovery	7.00	4.85	5.78
Average Percent Residual Oil Saturation	26.20	28.83	27.69
Average Percent Residual Water Saturation	68.57	64.11	66.04
Average Percent Total Residual Fluid Saturation	94.77	92.94	93.73
Average Original Oil Content, Bbls./A. Ft.	503.	450.	473.
Average Oil Recovery, Bbls./A. Ft.	105.	65.	82.
Average Residual Oil Content, Bbls./A. Ft.	398.	385.	391.
Total Original Oil Content, Bbls./Acre	1,510.	1,774.	3,284.
Total Oil Recovery, Bbls./Acre	315.	256.	571.
Total Residual Oil Content, Bbls./Acre	1,195.	1,518.	2,713.
Average Effective Permeability, Millidarcys	2.78	0.16	1.29
Average Initial Fluid Production Pressure, p.s.i.	22.9	50.0	32.7

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

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RESULTS OF WATER DIFFERENTIATION TESTS

TABLE VII

Company Emery Construction Co, Inc. Lease Hodges Well No. 1

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation		
			Connate	Drilling & Foreign	Total
1	1172.55	46,500			
2	1174.15	16,100			
3	1175.15	5,780			
4	1176.75	52,400			
5	1177.65	50,600			
6	1178.50	57,300			
7	1179.40	57,400			
8	1180.16	60,000			
9	1181.00	59,700			
10	1182.10	13,100			
11	1183.40	5,230			
12	1184.60	5,340			
13	1185.80	4,320			
14	1186.60	14,200			
15	1188.00	16,400			
16	1189.20	8,860			
17	1190.00	29,800			
18	1190.80	55,100			
19	1193.45	46,500			
20	1193.75	8,690			
21	1194.30	46,100			
22	1195.17	23,900			
23	1195.62	9,910			
24	1196.50	53,300			
25	1197.85	64,800			
26	1198.55	52,800			
27	1199.60	48,600			
28	1200.55	57,400			
29	1201.30	67,100			
30	1204.64	60,000			
31	1205.45	55,500			
32	1206.80	55,100			
33	1214.30	49,100			
34	1216.97	55,600			
35	1225.65	53,500			
36	1226.35	64,800			

Note: ppm - parts per million.

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SUMMARY OF WATER DIFFERENTIATION TESTS

TABLE VIII

Company Emery Construction Co., Inc. Lease Hodges Well No. 1

Depth Interval, Feet	Chloride Content of Brine in Sand, ppm	Average Percent Connate Water	Average Percent Drilling & Foreign Water
1172.30-1183.50	36,789		
1184.50-1195.85	24,092		
1196.33-1226.50	56,471		
1172.30-1226.50	41,423		

Note: ppm - parts per million.