

# OILFIELD RESEARCH LABORATORIES

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

November 19, 1981

KLI Petroleum  
P. O. Box 1159  
Henderson, Kentucky 42420

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Nelson Lease, Well No. KW-11, located in Allen County, Kansas and submitted to our laboratory on November 6, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/mkf

3 c to Henderson, Ky.  
2 c to Evansville, Ind.  
1 c to Mike Powell, P. O. Box 43  
Elmore, Ks.  
1 c to Russell Engineering  
Abilene, Tx.  
2 c to James E. Russell Petroleum, Inc.  
Chanute, Ks.

- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

**Oilfield Research Laboratories**  
**GENERAL INFORMATION & SUMMARY**

Company KLI Petroleum Lease Nelson Well No. KW-11  
 Location 950' WEL & 1570' SNL - SW $\frac{1}{4}$   
 Section 21 Twp. 26S Rge. 21E County Allen State Kansas

Elevation, Feet .....

Name of Sand.....

BARTLESVILLE

Top of Core .....

592.0

Bottom of Core .....

711.0

Top of Sand .....

593.2

Bottom of Sand .....

707.0

Total Feet of Permeable Sand .....

24.2

Total Feet of Floodable Sand .....

0.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 1	7.7	7.7
1 - 5	12.0	19.7
6 - 11	3.5	23.2
22 - 23	1.0	24.2

Average Permeability Millidarcys .....

3.4

Average Percent Porosity .....

12.5

Average Percent Oil Saturation .....

21.4

Average Percent Water Saturation.....

66.7

Average Oil Content, Bbls./A. Ft. ....

233.

Total Oil Content, Bbls./Acre.....

14,166.

Average Percent Oil Recovery by Laboratory Flooding Tests.....

0.

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. ....

0.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre .....

0.

Total Calculated Oil Recovery, Bbls./Acre.....

0.

The core was sampled and the samples sealed in plastic bags by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid. The core was reported to be from a non-virgin area.

Since the core did not respond to flooding susceptibility tests, no calculated recovery is given.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, <u>Feet</u>	<u>Description</u>
592.0 - 593.2	Gray shale.
593.2 - 595.0	Gray fossiliferous slightly calcareous shaly sandstone.
595.0 - 599.0	Gray slightly calcareous fossiliferous shale.
599.0 - 599.4	Coal.
599.4 - 607.0	Gray shale.
607.0 - 610.0	Gray slightly calcareous shaly sandstone.
610.0 - 612.0	Gray shaly sandstone.
612.0 - 619.5	Gray shale.
619.5 - 620.6	Coal.
620.6 - 624.0	Gray shaly sandstone.
624.0 - 630.0	Gray slightly calcareous shaly sandstone.
630.0 - 632.5	Gray shaly sandstone.
632.5 - 643.6	Gray and light brown laminated shale and sandstone.
643.6 - 648.4	Gray shaly sandstone.
648.4 - 652.4	Gray and brown laminated shale and sandstone.
652.4 - 654.0	Gray shale.

OILFIELD RESEARCH LABORATORIES

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654.0 - 665.5	Grayish light brown shaly sandstone.
665.5 - 667.0	Alternate layers of gray shale and brown sandstone.
667.0 - 668.0	Grayish brown shaly sandstone.
668.0 - 669.0	Brown sandstone with some shale partings.
669.0 - 672.2	Alternate layers of gray shale and brown sandstone.
672.2 - 703.0	Gray shale.
703.0 - 707.0	Grayish brown shaly sandstone.
707.0 - 710.8	Gray shale
710.8 - 711.0	Coal.

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company KLI Petroleum Lease Nelson Well No. KW-11

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	593.8	2.4	15	83	98	28	Imp.	0.8	0.8	22	0.00
2	594.7	7.0	22	57	79	120	Imp.	1.0	1.8	120	0.00
3	607.5	3.8	11	76	87	32	Imp.	1.0	2.8	32	0.00
4	608.5	10.2	27	57	84	214	2.9	1.0	3.8	214	2.90
5	609.6	8.6	9	87	96	60	Imp.	1.0	4.8	60	0.00
6	610.5	8.7	1	95	96	7	Imp.	1.0	5.8	7	0.00
7	611.6	9.7	8	75	83	60	Imp.	1.0	6.8	60	0.00
8	621.4	9.2	22	71	93	157	Imp.	1.4	8.2	220	0.00
9	622.5	7.2	9	86	95	50	Imp.	1.0	9.2	50	0.00
10	623.4	8.5	11	87	98	73	0.20	1.0	10.2	73	0.20
11	624.6	9.2	7	89	96	50	Imp.	1.0	11.2	50	0.00
12	625.6	7.4	6	91	97	34	Imp.	1.0	12.2	34	0.00
13	626.4	11.7	2	93	95	18	Imp.	1.0	13.2	18	0.00
14	627.7	9.6	7	90	97	52	Imp.	1.0	14.2	52	0.00
15	628.7	9.4	17	77	94	124	Imp.	1.0	15.2	124	0.00
16	629.6	10.0	19	79	98	147	Imp.	1.0	16.2	147	0.00
17	630.7	8.9	9	86	95	62	Imp.	1.0	17.2	62	0.00
18	631.6	12.6	9	88	97	88	Imp.	1.5	18.7	132	0.00
19	632.7	9.7	28	31	59	211	Imp.	0.5	19.2	106	0.00
20	633.6	15.3	27	41	68	321	1.4	1.0	20.2	321	1.40
21	634.5	12.3	28	68	96	267	Imp.	1.0	21.2	267	0.00
22	635.4	16.3	30	50	80	379	2.2	1.0	22.2	379	2.20
23	636.4	12.2	21	72	93	199	Imp.	1.0	23.2	199	0.00
24	637.7	13.2	21	69	90	215	0.37	1.0	24.2	215	0.37
25	638.5	15.2	28	54	82	330	1.5	1.0	25.2	330	1.50
26	639.5	16.3	30	51	81	379	6.0	1.0	26.2	379	6.00
27	640.5	15.7	15	53	68	183	7.5	1.0	27.2	183	7.50
28	641.5	17.3	28	40	68	376	2.8	1.0	28.2	376	2.80
29	642.7	12.4	26	67	93	250	Imp.	1.0	29.2	250	0.00
30	643.4	12.1	17	79	96	160	Imp.	0.6	29.8	96	0.00
31	644.4	10.1	14	78	92	110	Imp.	1.4	31.2	154	0.00

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company KLI Petroleum Lease Nelson Well No. KW-11

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.		
32	645.6	11.3	7	80	87	61	Imp.	1.4	32.6	85	0.00
33	646.6	11.5	18	75	93	161	Imp.	1.0	33.6	161	0.00
34	647.6	12.4	25	65	90	241	Imp.	1.0	34.6	241	0.00
35	648.6	11.7	15	76	91	136	Imp.	1.0	35.6	136	0.00
36	649.5	11.8	18	66	84	165	Imp.	1.0	36.6	165	0.00
37	650.5	13.5	33	64	97	346	Imp.	0.9	37.5	311	0.00
38	651.4	2.7	6	91	97	13	Imp.	1.1	38.6	14	0.00
39	654.9	11.1	18	78	96	155	Imp.	1.0	39.6	155	0.00
40	655.6	13.6	30	56	86	317	0.28	1.0	40.6	317	0.28
41	656.4	13.0	34	64	98	343	0.22	1.0	41.6	343	0.22
42	657.4	17.4	36	58	94	486	0.89	1.0	42.6	486	0.89
43	658.3	17.9	19	50	69	264	1.6	1.0	43.6	264	1.60
44	659.9	10.7	2	95	97	17	Imp.	1.0	44.6	17	0.00
45	660.2	15.1	15	55	70	176	1.9	1.0	45.6	176	1.90
46	661.9	17.4	34	45	79	459	4.9	1.0	46.6	459	4.90
47	662.8	16.2	31	50	81	390	1.9	1.0	47.8	390	1.90
48	663.2	16.7	32	55	87	415	3.3	1.0	48.6	415	3.30
49	664.7	15.8	38	52	90	466	Imp.	1.0	49.6	466	0.00
50	665.4	15.6	37	39	76	448	0.28	0.5	50.1	224	0.14
51	666.7	19.5	42	37	79	635	10.	1.5	51.6	953	15.00
52	667.3	14.8	43	50	93	494	Imp.	1.0	52.6	494	0.00
53	668.6	19.4	34	44	78	512	22.	1.0	53.6	512	22.00
54	669.8	16.4	58	38	96	738	2.1	1.0	54.6	738	2.10
55	670.9	18.2	57	30	87	805	0.59	1.0	55.6	805	0.59
56	671.6	15.3	43	46	89	510	0.85	1.2	56.8	612	1.02
57	703.5	12.8	12	59	71	119	Imp.	1.0	57.8	119	0.00
58	704.5	13.8	9	83	92	96	Imp.	1.0	58.8	96	0.00
59	705.5	15.3	16	82	98	190	Imp.	1.0	59.8	190	0.00
60	706.6	14.0	11	72	83	120	1.0	1.0	60.8	120	1.00

**SUMMARY OF PERMEABILITY & SATURATION TESTS**

**TABLE III**

Company KLI Petroleum Lease Nelson Well No. KW-11

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
593.2 - 633.0	2.0	1.6	3.10
633.0 - 642.0	7.0	3.1	21.77
642.0 - 655.0	0.0	0.0	0.00
655.0 - 661.0	5.0	1.1	4.89
661.0 - 672.2	9.2	5.5	50.95
703.0 - 707.0	1.0	1.0	1.00
593.2 - 707.0	24.2	3.4	81.71

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
593.2 - 633.0	19.2	8.8	12.3	80.1	81	1,553
633.0 - 642.0	9.0	14.9	25.3	55.3	294	2,649
642.0 - 655.0	11.4	10.8	17.2	74.9	155	1,768
655.0 - 661.0	6.0	14.6	22.7	63.0	267	1,603
661.0 - 672.2	11.2	17.0	41.1	44.1	542	6,068
703.0 - 707.0	4.0	14.0	12.0	74.0	131	525
593.2 - 707.0	60.8	12.5	21.4	66.7	233	14,166

**RESULTS OF LABORATORY FLOODING TESTS**

**TABLE IV**

Company KLI Petroleum Lease Nelson Well No. KW-11

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.
			%	Bbbs./A. Ft.	%	Bbbs./A. Ft.	% Oil	% Water	Bbbs./A. Ft.			
1	593.8	2.6	15	30	0	0	15	83	30	0	Imp.	--
2	594.7	7.2	22	123	0	0	22	59	123	0	Imp.	--
3	607.5	3.9	11	33	0	0	11	77	33	0	Imp.	--
4	608.5	10.5	27	220	0	0	27	58	220	0	Imp.	--
5	609.6	8.7	9	61	0	0	9	88	61	0	Imp.	--
6	610.5	8.9	1	7	0	0	1	96	7	0	Imp.	--
7	611.6	9.5	8	59	0	0	8	76	59	0	Imp.	--
8	621.4	9.0	22	154	0	0	22	72	154	0	Imp.	--
9	622.5	7.3	9	51	0	0	9	87	51	0	Imp.	--
10	623.4	8.6	11	73	0	0	11	87	73	0	Imp.	--
11	624.6	9.4	7	51	0	0	7	89	51	0	Imp.	--
12	625.6	7.5	6	35	0	0	6	92	35	0	Imp.	--
13	626.4	11.9	2	18	0	0	2	94	18	0	Imp.	--
14	627.7	9.8	7	53	0	0	7	91	53	0	Imp.	--
15	628.7	9.0	18	126	0	0	18	78	126	0	Imp.	--
16	629.6	10.1	19	149	0	0	19	79	149	0	Imp.	--
17	630.7	8.8	9	61	0	0	9	87	61	0	Imp.	--
18	631.6	12.7	9	89	0	0	9	89	89	0	Imp.	--
19	632.7	10.2	27	214	0	0	27	33	214	0	Imp.	--
20	633.6	15.4	27	323	0	0	27	43	323	0	Imp.	--
21	634.5	12.5	28	272	0	0	28	69	272	0	Imp.	--
22	635.4	16.2	30	377	0	0	30	52	377	0	Imp.	--
23	636.4	17.3	21	282	0	0	21	73	282	0	Imp.	--
24	637.7	13.4	21	218	0	0	21	70	218	0	Imp.	--
25	638.5	15.1	28	328	0	0	28	55	328	0	Imp.	--
26	639.5	16.4	30	382	0	0	30	52	382	0	Imp.	--
27	640.5	15.8	15	184	0	0	15	55	184	0	Imp.	--
28	641.5	16.8	29	378	0	0	29	41	378	0	Imp.	--
29	642.7	12.9	25	250	0	0	25	69	250	0	Imp.	--
30	643.4	12.2	17	161	0	0	17	80	161	0	Imp.	--

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.

**RESULTS OF LABORATORY FLOODING TESTS**

**TABLE IV**

Company KLI Petroleum Lease Nelson Well No. KW-11

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.			
31	644.5	10.3	14	112	0	0	14	79	112	0	Imp.	-
32	645.6	11.4	7	62	0	0	7	81	62	0	Imp.	-
33	646.6	11.6	18	162	0	0	18	76	162	0	Imp.	-
34	647.6	12.3	25	239	0	0	25	66	239	0	Imp.	-
35	648.6	11.6	15	135	0	0	15	77	135	0	Imp.	-
36	649.5	11.7	18	163	0	0	18	67	163	0	Imp.	-
37	650.5	14.0	32	348	0	0	32	65	348	0	Imp.	-
38	651.4	2.9	6	13	0	0	6	92	13	0	Imp.	-
39	654.9	11.3	18	158	0	0	18	79	158	0	Imp.	-
40	655.6	13.7	30	319	0	0	30	57	319	0	Imp.	-
41	656.4	13.5	33	346	0	0	33	65	346	0	Imp.	-
42	657.4	17.5	36	489	0	0	36	59	489	0	Imp.	-
43	658.3	17.8	19	262	0	0	19	51	262	0	Imp.	-
44	659.9	10.4	2	16	0	0	2	96	16	0	Imp.	-
45	660.2	15.1	15	176	0	0	15	56	176	0	Imp.	-
46	661.9	17.3	34	456	0	0	34	46	456	0	Imp.	-
47	662.8	16.3	31	392	0	0	31	51	392	0	Imp.	-
48	663.2	16.2	33	415	0	0	33	56	415	0	Imp.	-
49	664.7	15.7	38	463	0	0	38	53	463	0	Imp.	-
50	665.4	15.5	37	445	0	0	37	40	445	0	Imp.	-
51	666.7	19.6	42	639	0	0	42	38	639	0	Imp.	-
52	667.3	14.9	43	497	0	0	43	51	497	0	Imp.	-
53	668.6	19.0	35	516	0	0	35	45	516	0	Imp.	-
54	669.8	16.5	58	742	0	0	58	39	742	0	Imp.	-
55	670.9	18.6	56	808	0	0	56	31	808	0	Imp.	-
56	671.6	15.4	43	514	0	0	43	47	514	0	Imp.	-
57	703.5	12.9	12	120	0	0	12	60	120	0	Imp.	-
58	704.5	13.7	9	96	0	0	9	84	96	0	Imp.	-
59	705.5	14.8	17	195	0	0	17	81	195	0	Imp.	-
60	706.6	14.1	11	120	0	0	11	73	120	0	Imp.	-

Notes: cc—cubic centimeter.

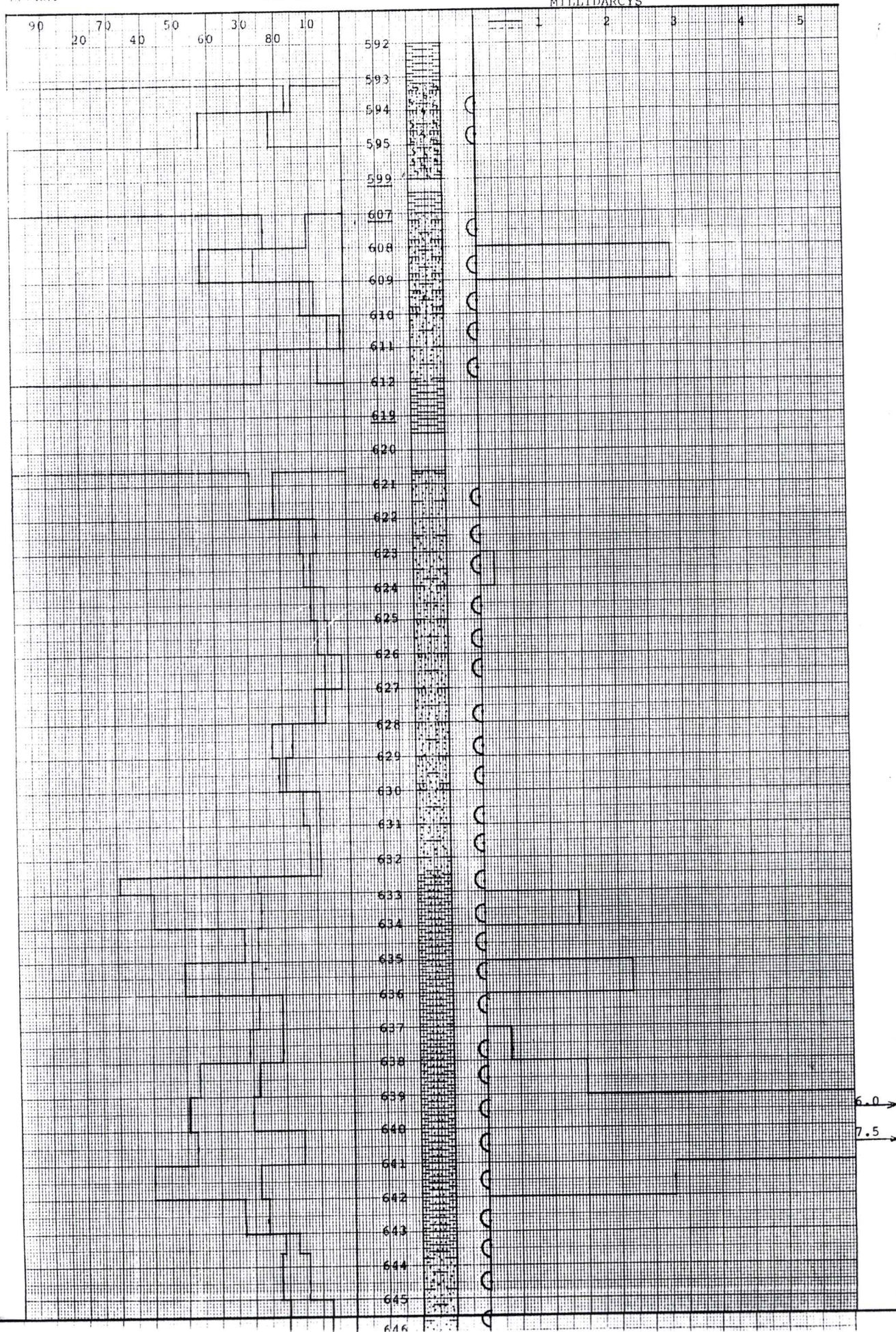
\*—Volume of water recovered at the time of maximum oil recovery.

\*\*—Determined by passing water through sample which still contains residual oil.

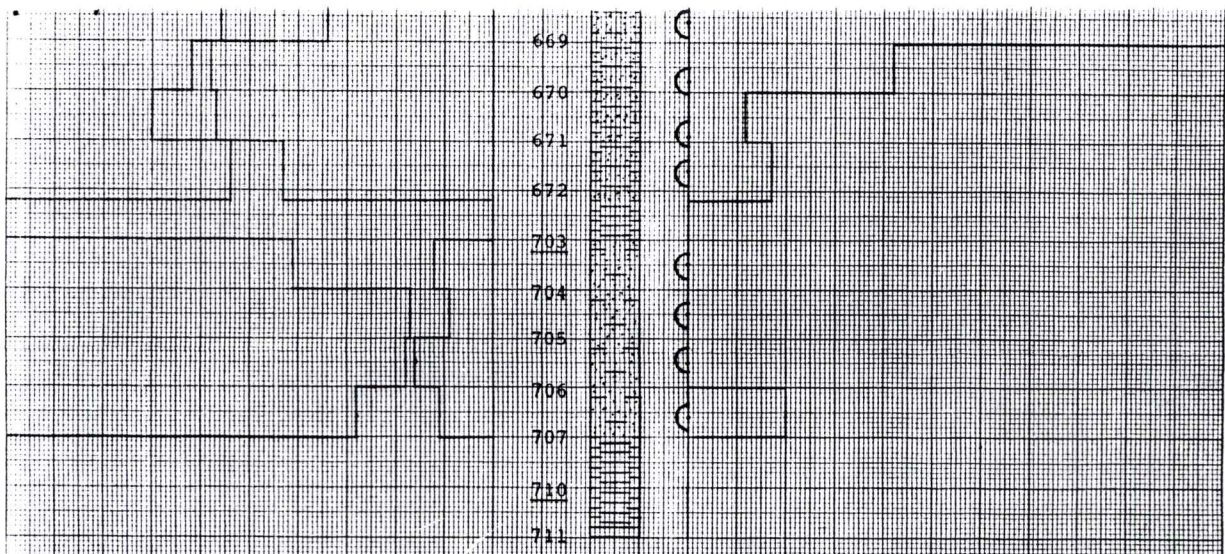
WATER SAT., PERCENT

OIL SAT., PERCENT

PERMEABILITY, IN MILLIDARCY  
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCY







KEY:

SHALE

COAL

SHALY CALCAREOUS SANDSTONE

SHALY SANDSTONE

LAMINATED SANDSTONE AND SHALE

SANDSTONE WITH SHALE PARTINGS

FOSSILIFEROUS CALCAREOUS SHALE

FOSSILIFEROUS SHALY CALCAREOUS SANDSTONE

ALTERNATE LAYERS OF SANDSTONE AND SHALE

○ IMPERMEABLE TO WATER

# KLI PETROLEUM CORPORATION

NELSON LEASE

ALLEN COUNTY, KANSAS

WELL NO. KQ-11

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCY'S	CALCULATED OIL RECOVERY, BBL'S. / ACRE
593.2 - 633.0	19.2	8.8	12.2	80.1	1.8	
633.0 - 642.0	9.0	14.9	25.3	55.3	3.1	
642.0 - 655.0	11.4	10.8	17.2	74.9	0.0	
655.0 - 661.0	6.0	14.6	22.7	63.0	1.0	
661.0 - 672.2	11.2	17.0	41.1	44.1	5.5	
703.0 - 707.0	4.0	14.0	12.0	74.0	1.0	
593.2 - 707.0	60.8	12.5	21.4	66.7	3.4	

OILFIELD RESEARCH LABORATORIES  
 CHANDLER, KANSAS  
 NOVEMBER, 1981

PDC