OILFIELD RESEARCH LABORATORIES

P. O. BOX 647 - CHANUTE, KANSAS 66720 - PHONE (316) 431-2650

January 25, 1984

Mack C. Colt, Inc.
P. O. Box 388
Iola, Kansas 66749

Gentlemen:

Enclosed herewith are the results of tests run on the rotary core taken from the Cochran Lease, Well No. 70-A, located in Anderson County, Kansas.

The core was sampled and sealed in plastic bags by a representative of Oilfield Research Laboratories and submitted to our laboratory on January 17, 1984.

At the request of the client, only 7 samples were subjected to waterflood susceptibility tests.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman

BRP/ph

5 c to Iola, KS
1 c to John Arseneau, Tulsa, OK
1 c to Dan Busch, Tulsa, OK
1 c to Jim Regula, Chanute, KS

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GENERAL INFORMATION & SUMMARY

Company Mack C. Colt, Inc. Lease Cochran Well No. 70-A

Location 90' FNL & 280' FEL

Section 9 Twp. 22S Rge. 21E County Anderson State Kansas

Elevation, Feet	
Name of Sand	Bartlesville
Top of Core	707.0
Bottom of Core	755.4
Top of Sand	707.0
Bottom of Sand	733.0
Total Feet of Permeable Sand	38.1

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 2	6.6	6.6
3 - 7	2.9	9.5
13 - 26	4.8	14.3
26 - 46	8.4	22.7
46 - 66	5.5	28.2
66 - 88	2.3	30.5
88 - 114	1.6	32.1
114 - 146	3.0	35.1
158 - 204	3.0	38.1

Average Permeability Millidarcys	54.0
Average Percent Porosity	18.3
Average Percent Oil Saturation	37.3
Average Percent Water Saturation	52.5
Average Oil Content, Bbls./A. Ft.	543.
Total Oil Content, Bbls./Acre	20,685.

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LOG

Company Mack C. Colt, Inc. Lease Cochran Well No. 70-A

Depth Interval, Feet	Description
707.0 - 709.5	Grayish brown very shaly sandstone.
709.5 - 710.5	Gray and brown laminated shale and sandstone.
710.5 - 710.8	Brown shaly sandstone.
710.8 - 711.5	Gray shale.
711.5 - 712.1	Alternate layers gray shale and brown sandstone.
712.1 - 712.8	Light brown shaly sandstone with scattered gray shale partings.
712.8 - 713.0	Gray shale.
713.0 - 713.5	Light brown shaly sandstone with scattered gray shale partings.
713.5 - 713.8	Gray shale.
713.8 - 717.0	Light brown sandstone with scattered gray shale inclusions.
717.0 - 717.9	Gray and brown laminated shale and sandstone.
717.9 - 722.3	Light brown sandstone with scattered gray shale and mica inclusions.
722.3 - 722.8	Brown sandstone with gray shale and mica inclusions.
722.8 - 730.5	Dark brown sandstone with scattered gray shale and mica inclusions.
730.5 - 730.8	Gray shale.
730.8 - 731.6	Dark brown sandstone with scattered carbonaceous inclusions.
731.6 - 732.0	Gray shale.
732.0 - 732.6	Dark brown sandstone.
732.6 - 734.9	Gray shale.
734.9 - 736.0	Brown sandstone.
736.0 - 737.2	Dark brown sandstone.

Continued

LOG

Company Mack C. Colt, Inc. Lease Cochran Well No. 70-A

Depth Interval, Feet	Description
737.2 - 743.5	Brown sandstone with scattered gray shale and mica inclusions.
743.5 - 744.3	Dark brown sandstone.
744.3 - 747.3	Gray shale.
747.3 - 749.0	Black carbonaceous sandstone.
749.0 - 750.3	Gray and brown laminated shale and sandstone.
750.3 - 750.6	Brown slightly shaly sandstone.
750.6 - 751.3	Gray and brown laminated shale and sandstone.
751.3 - 751.6	Dark brown sandstone.
751.6 - 753.0	Grayish black slightly carbonaceous shaly sandstone.
753.0 - 755.4	Gray shale.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Mack C. Colt, Inc. Lease Cochran Well No. 70-A

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	707.6	13.2	15	82	97	154	0.63	1.3	1.3	200	0.82
2	708.8	12.5	24	72	96	233	0.50	1.2	2.5	280	0.60
3	709.7	12.5	18	73	91	175	1.0	1.0	3.5	175	1.00
4	710.7	14.8	26	58	84	299	1.1	0.3	3.8	90	0.33
5	711.6	12.8	24	73	97	238	0.16	0.6	4.4	143	0.10
6	712.5	14.6	17	68	85	193	4.7	0.7	5.1	135	3.29
7	713.4	16.1	11	77	88	137	3.1	0.5	5.6	69	1.55
8	714.8	20.5	17	80	97	270	44.	1.2	6.8	324	52.80
9	715.5	17.8	10	63	73	138	58.	1.0	7.8	138	58.00
10	716.3	21.6	18	74	92	302	56.	1.0	8.8	302	56.00
11	717.6	11.7	20	78	98	182	0.31	0.9	9.7	164	0.28
12	718.4	20.6	13	79	92	208	42.	1.4	11.1	291	58.80
13	719.5	15.8	11	86	97	135	19.	1.0	12.1	135	19.00
14	720.6	19.9	13	76	89	201	127.	1.0	13.1	201	127.00
15	721.5	20.9	21	75	96	341	113.	1.0	14.1	341	113.00
16	722.6	16.6	32	56	88	412	20.	0.5	14.6	206	10.00
17	723.5	19.5	30	36	66	454	158.	1.0	15.6	454	158.00
18	724.5	19.6	51	45	96	776	72.	1.0	16.6	776	72.00
19	725.5	19.0	40	49	89	590	82.	1.0	17.6	590	82.00
20	726.5	18.8	45	50	95	656	19.	1.0	18.6	656	19.00

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Mack C. Colt, Inc. Lease Cochran Well No. 70-A

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.		
21	727.7	18.8	39	42	81	569	56.	1.0	19.6	569	56.00
22	728.7	18.0	42	50	92	587	28.	1.0	20.6	587	28.00
23	729.5	22.9	50	36	86	888	145.	0.8	21.4	710	116.00
24	730.4	22.4	49	38	87	852	169.	0.9	22.3	767	152.10
25	731.5	21.4	53	43	96	880	44.	0.8	23.1	704	35.20
26	732.4	19.2	51	43	94	760	108.	0.6	23.7	456	64.80
27	735.5	19.5	62	29	91	938	62.	1.1	24.8	1032	68.20
28	736.5	21.2	53	28	81	872	145.	1.2	26.0	1046	174.00
29	737.7	18.4	48	45	93	685	43.	1.0	27.0	685	43.00
30	738.7	17.5	55	41	96	747	13.	1.0	28.0	747	13.00
31	739.6	18.3	58	40	98	823	37.	1.0	29.0	823	37.00
32	740.6	19.4	62	27	89	933	44.	1.0	30.0	933	44.00
33	741.5	21.4	43	40	83	714	60.	1.0	31.0	714	60.00
34	742.4	17.5	49	48	97	665	22.	1.3	32.3	865	28.60
35	743.6	23.5	33	40	73	602	169.	0.4	32.7	241	67.60
36	744.2	21.7	56	37	93	943	52.	0.4	33.1	377	20.80
37	747.6	22.1	42	27	69	720	203.	0.7	33.8	504	142.10
38	748.4	20.9	46	35	81	746	44.	1.0	34.8	746	44.00
39	749.5	15.3	54	41	95	641	0.59	1.3	36.1	833	0.77
40	750.5	18.2	70	28	98	988	6.8	0.3	36.4	296	2.04
41	751.5	18.5	54	38	92	775	68.	0.3	36.7	233	20.40
42	752.5	17.3	61	25	86	819	4.9	1.4	38.1	1147	6.86

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Mack C. Colt, Inc. Lease Cochran Well No. 70-A

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
707.0 - 722.3	14.1	34.9	492.57
722.3 - 753.0	24.0	65.2	1565.47
707.0 - 753.0	38.1	54.0	2058.04

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
707.0 - 722.3	14.1	16.7	16.7	75.5	212	2,988
722.3 - 753.0	24.0	19.3	49.4	39.0	737	17,697
707.0 - 753.0	38.1	18.3	37.3	52.5	543	20,685

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Mack C. Colt, Inc. Lease Cochran Well No. 70-A

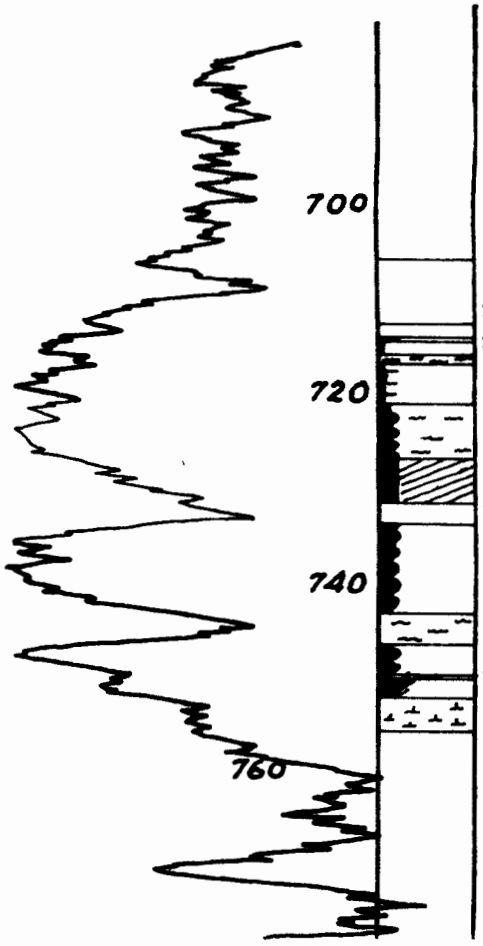
Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	Effective Permeability Millidarcys**	Initial Fluid Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
10	716.3	22.1	18	309	2	34	16	78	275	370	19.79	10
18	724.5	19.4	51	768	17	255	34	62	513	464	6.30	15
23	729.5	23.0	50	892	22	393	28	60	499	218	14.74	15
28	736.5	21.2	53	872	11	181	42	41	691	272	13.71	15
33	741.5	21.0	43	701	5	81	38	57	620	134	2.02	20
38	748.4	21.2	46	757	2	33	44	51	724	222	3.60	20
42	752.5	17.6	61	833	0	0	61	26	833	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.

M.C. COLT 70A COCHRAN
NE/4 9, 22S-21E
ELEV. 1027.9'

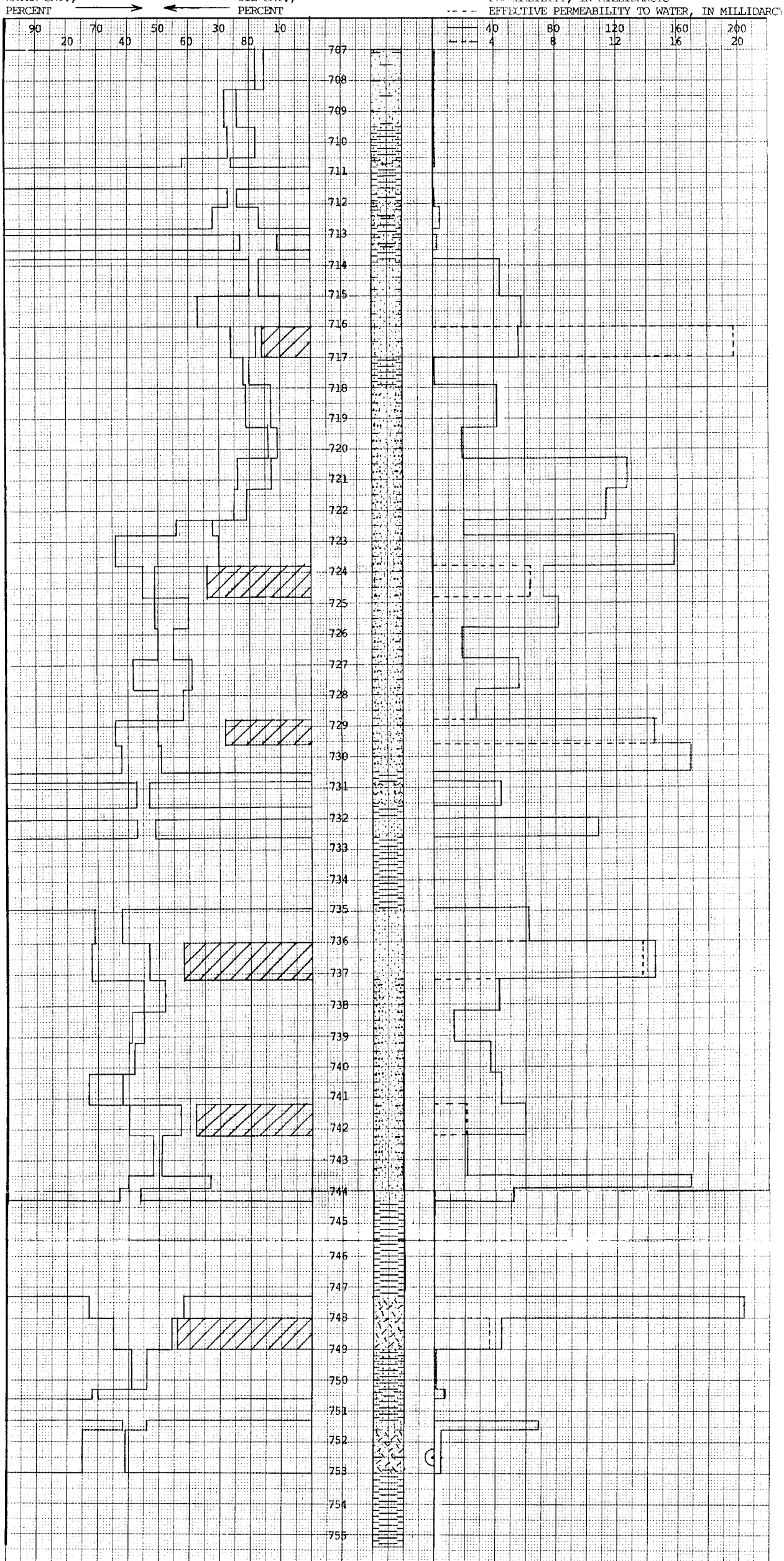


706.0 Sh, med → lt gry, minutely rippled, interl & thinly interb w/ sltst, occas 1-2" bed of vy. fn. gr. ss., carb. plant remains
712.8 Ss, vy fn gr, L, scat mica, no sat
714.1 Ss, vitr fn → med gr por, fair sat, poss watered out
714.5 Ss, vy fn gr, L, scat mica, lt sat, poss watered out
716.0 Sh & sltst in kent lens, minutely rippled
716.8 Ss, vy fn gr, w/ lt sat, interb w/ Ss, fn gr, good sat, vy fn gr : fn gr = 80:20
721.3 Ss, fn gr, mottled fair & good sat, scat interl wh sltst.
726.8 Ss, fn gr, good sat, w/ sev. .2"-.4" med gry sh, 30° x strat.
731.5 Sh, med gry, horiz. bed
733.9 Ss, fn → med gr, fair → good sat
743.4 Sh, med gry, w/ 15% paper thin interl wh sltst.
746.3 Ss, fn → med gr, w/ scat wavy thin ptings of wh sltst, fair → good sat
749.5 Sh, med gry & sltst, interl
750.0 Ss, fn → med gr, dead oil sat, 30° x strat in basal .3'
752.0 Sh, med gry, w/ great abund is clasts, vy gnarly fr. 753-753.5'
755.5

POINT BAR ZONATION
D
C
B
A

NOTE: CORE DEPTHS ARE ADJUSTED UP 1'0" TO CORRELATE WITH GAMM LOG

26.4' TOTAL FOOTAGE OF FLOODABLE SAND



KEY:

- SHALE
- SHALY SANDSTONE
- SHALY CARBONACEOUS SANDSTONE
- SANDSTONE
- CARBONACEOUS SANDSTONE
- IMPERMEABLE TO WATER
- LAMINATED SHALE AND SANDSTONE
- ALTERNATE LAYERS OF SHALE AND SANDSTONE
- SHALY SANDSTONE WITH SHALE PARTINGS
- SANDSTONE WITH SHALE INCLUSIONS
- SANDSTONE WITH SHALE AND MICA INCLUSIONS
- SANDSTONE WITH CARBONACEOUS INCLUSIONS
- FLOODPOT RESDIUAL OIL SATURATION

MACK C. COLT, INC.

COCHRAN LEASE — WELL NO. 70-A

ANDERSON COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS
707.0 - 722.3	14.1	16.7	16.7	75.5	34.9
722.3 - 753.0	24.0	19.3	49.4	39.0	65.2
707.0 - 753.0	38.1	18.3	37.3	52.5	54.0

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CHANUTE, KANSAS
JANUARY, 1984 RAL