



# OILFIELD RESEARCH LABORATORIES

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

April 19, 1979

ANDCO Oil Producers, Inc.  
910 West Elm  
Chanute, Kansas 66720

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the East Rustman Lease, Well No. 5, Neosho County, Kansas, and submitted to our laboratory on April 12, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

*Benjamin R. Pearman*  
Benjamin R. Pearman

SAM:cgb

5 c to Chanute, Kansas



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The core was sampled by a representative of Oilfield Research Laboratories. The drilling fluid consisted of fresh water mud. The core was reported to be from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
716.0 - 719.0	Gray shale.
719.0 - 724.0	Brown sandstone.
724.0 - 724.9	Brown slightly shaly sandstone.
724.9 - 726.0	Brown sandstone.
726.0 - 727.0	Brown slightly shaly sandstone.
727.0 - 730.0	Brown sandstone.
730.0 - 731.0	Brown slightly shaly sandstone.
731.0 - 738.0	Brown sandstone.
738.0 - 739.0	Brown slightly shaly sandstone.
739.0 - 748.0	Brown sandstone.
748.0 - 752.2	Light brown micaceous sandstone.
752.2 - 756.0	Loss.

SUMMARY

From a study of the data, it would appear that efficient primary and waterflood operations in the vicinity of this well should recover approximately 3,460 barrels of oil per acre. This is an average recovery of 216 barrels per acre foot from the 16.0 feet of floodable sand analyzed in this core.

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

Original formation volume factor	1.05
Reservoir water saturation, percent	35.0
Average porosity, percent	17.3
Oil saturation after flooding, percent	29.7
Performance factor, percent	50.0
Net floodable pay sand, feet	16.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE I-B

Company ANDCO Oil Producers, Inc. Lease East Rustman Well No. 5

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	719.5	16.3	37	53	90	468	24.	1.0	1.0	468	24.00
2	720.5	18.0	39	42	81	545	4.4	1.0	2.0	545	4.40
3	721.5	18.8	45	39	84	656	39.	1.0	3.0	656	39.00
4	722.5	18.7	46	41	87	667	40.	1.0	4.0	667	40.00
5	723.5	18.6	49	33	82	707	12.	1.0	5.0	707	12.00
6	724.5	15.7	43	44	87	524	3.8	0.9	5.9	472	3.42
7	725.5	17.2	45	40	85	601	38.	1.1	7.0	661	41.80
8	726.5	15.8	33	47	80	405	3.8	1.0	8.0	405	3.80
9	727.5	16.9	42	40	82	551	34.	1.0	9.0	551	34.00
10	728.5	16.0	43	40	83	534	12.	1.0	10.0	534	12.00
11	729.5	17.6	41	39	80	560	14.	1.0	11.0	560	14.00
12	730.5	14.9	36	58	94	416	5.0	1.0	12.0	416	5.00
13	731.5	16.8	42	43	85	547	42.	1.0	13.0	547	42.00
14	732.5	15.8	41	48	89	503	3.6	1.0	14.0	503	3.60
15	733.5	13.7	27	59	86	287	5.9	1.0	15.0	287	5.90
16	734.5	16.9	33	47	80	433	3.1	1.0	16.0	433	3.10
17	735.5	16.4	34	56	90	433	9.1	1.0	17.0	433	9.10
18	736.5	18.8	29	50	79	423	29.	1.0	18.0	423	29.00
19	737.5	17.1	35	52	87	464	9.3	1.0	19.0	464	9.30
20	738.5	14.6	28	60	88	317	2.0	1.0	20.0	317	2.00
21	739.5	16.8	38	48	86	495	19.	1.0	21.0	495	19.00
22	740.5	14.5	32	63	95	360	6.7	1.0	22.0	360	6.70
23	741.5	18.7	33	51	84	479	36.	1.0	23.0	479	36.00
24	742.5	17.9	29	56	85	403	27.	1.0	24.0	403	27.00
25	743.5	16.7	35	51	86	454	8.2	1.0	25.0	454	8.20
26	744.5	17.0	39	44	83	514	7.7	1.0	26.0	514	7.70
27	745.5	15.0	31	55	86	361	55.	1.0	27.0	361	55.00
28	746.5	16.7	33	62	95	428	18.	1.0	28.0	428	18.00
29	747.5	17.7	24	71	95	330	26.	1.0	29.0	330	26.00
30	748.5	15.9	18	77	95	222	60.	1.0	30.0	222	60.00
31	749.5	22.4	16	80	96	278	38.	1.0	31.0	278	38.00

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**RESULTS OF SATURATION & PERMEABILITY TESTS**

TABLE 1-B

Company ANDCO Oil Producers, Inc. Lease East Rustman Well No. 5

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	750.5	21.5	15	70	85	250	84.	1.0	32.0	250	84.00
33	751.5	17.9	15	71	86	208	22.	1.2	33.2	250	26.40

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company ANDCO Oil Producers, Inc. Lease East Rustman Well No. 5

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
719.0 - 733.0	14.0	19.9	279.02	719.0 - 733.0	14.0	19.9	279.02	16.9	41.5	43.3	549	7,692
733.0 - 752.2	19.2	24.5	470.40	733.0 - 752.2	19.2	24.5	470.40	17.2	28.5	59.2	374	7,181
719.0 - 752.2	33.2	22.6	749.42	719.0 - 752.2	33.2	22.6	749.42	17.1	34.0	52.5	448	14,873

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**RESULTS OF LABORATORY FLOODING TESTS**

**TABLE IV**

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			
1	719.5	16.8	37	483	14	182	23	73	16	0.45	20
2	720.5	17.6	39	532	11	151	28	64	3	0.23	30
3	721.5	18.4	45	642	22	314	23	73	23	0.53	20
4	722.5	18.8	46	671	23	335	23	72	163	4.20	10
5	723.5	18.1	49	688	12	168	37	60	19	0.53	25
6	724.5	15.6	43	521	10	121	33	64	5	0.23	25
7	725.5	17.3	45	604	15	202	30	66	191	4.95	10
8	726.5	16.2	33	415	0	0	33	61	0	Imp.	-
9	727.5	17.3	42	564	8	107	34	60	27	0.75	25
10	728.5	16.0	43	534	0	0	43	53	0	Imp.	-
11	729.5	17.6	41	560	13	178	28	69	4	0.23	40
12	730.5	15.0	36	419	0	0	36	60	0	Imp.	-
13	731.5	17.3	42	564	12	161	30	65	56	1.43	20
14	732.5	16.3	41	518	9	114	32	64	5	0.17	25
15	733.5	14.0	26	282	0	0	26	70	0	Imp.	-
16	734.5	16.9	32	420	0	0	32	64	0	Imp.	-
17	735.5	16.6	34	438	0	0	34	61	0	Imp.	-
18	736.5	18.3	28	397	0	0	28	66	0	Imp.	-
19	737.5	17.2	35	467	3	40	32	65	23	0.54	35
20	738.5	14.7	29	330	0	0	29	66	4	0.30	35
21	739.5	16.5	38	486	3	39	35	60	0	Imp.	-
22	740.5	15.0	32	372	2	23	30	63	3	0.15	45
23	741.5	19.0	33	486	2	29	31	66	2	0.15	45
24	742.5	17.5	29	394	2	27	27	68	11	0.29	25
25	743.5	16.3	35	443	0	0	35	62	37	0.56	20
26	744.5	16.5	36	461	0	0	38	60	4	0.15	40
27	745.5	15.5	31	373	0	0	31	66	4	0.13	40
28	746.5	17.2	33	441	0	0	33	62	13	0.27	25
29	747.5	18.0	24	335	0	0	24	71	255	4.50	10
30	748.5	16.4	18	229	0	0	18	78	146	3.37	10
									254	6.70	20

Company ANDO Oil Producers, Inc. Lease East Rustman Well No. 5

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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## RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company		Lease		East Rustman		Well No.		5			
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			
31	749.5	22.3	16	277	0	0	16	81	277	12.52	10
32	750.5	21.0	16	261	0	0	16	80	35	0.98	20
33	751.5	18.1	17	239	0	0	17	79	45	1.05	15

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	Lease	East Rustman	Well No.
ANDCO Oil Producers, Inc.	719.0 - 733.0	733.0 - 752.2	719.0 - 752.2
Depth Interval, Feet	11.0	5.0	16.0
Feet of Core Analyzed	17.4	17.0	17.3
Average Percent Porosity	42.8	33.4	39.8
Average Percent Original Oil Saturation	13.6	2.4	10.1
Average Percent Oil Recovery	29.2	31.0	29.7
Average Percent Residual Oil Saturation	66.4	64.4	65.8
Average Percent Residual Water Saturation	95.6	95.4	95.5
Average Percent Total Residual Fluid Saturation	578.	441.	535.
Average Original Oil Content, Bbls./A. Ft.	186.	32.	137.
Average Oil Recovery, Bbls./A. Ft.	392.	409.	398.
Average Residual Oil Content, Bbls./A. Ft.	6,355.	2,205.	8,560.
Total Original Oil Content, Bbls./Acre	2,041.	158.	2,199.
Total Oil Recovery, Bbls./Acre	4,314.	2,047.	6,361.
Total Residual Oil Content, Bbls./Acre	1.29	0.29	0.98
Average Effective Permeability, Millidarcys	22.7	34.0	26.3
Average Initial Fluid Production Pressure, p.s.i.			

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