

# OILFIELD RESEARCH LABORATORIES

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

November 4, 1981

Mid-States Energy Corporation  
P. O. Box 371  
Paola, Kansas 66071

Gentlemen:

Enclosed herewith are the results of tests run on the rotary core taken from the Forest-Edwards Lease, Well No. 3, located in Miami County, Kansas.

The core was sampled and sealed in plastic bags by a representative of the client and submitted to our laboratory on October 27, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/mkf

5 c to Paola, Ks.

- REGISTERED ENGINEERS -

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

**Offield Research Laboratories**  
**GENERAL INFORMATION & SUMMARY**

Company Mid-States Energy Corp. Lease Forest-Edwards Well No. 3

Location \_\_\_\_\_

Section 31 Twp. 16S Rge. 24E County Miami State Kansas

Elevation, Feet .....

Name of Sand.....

CATTLEMAN

Top of Core .....

548.0

Bottom of Core .....

586.0

Top of Sand .....(Tested).....

549.0

Bottom of Sand .....

585.0

Total Feet of Permeable Sand .....

32.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 7	2.0	2.0
30 - 95	7.4	9.4
100 - 200	11.4	20.8
200 - 350	8.6	29.4
450 - 665	2.7	32.1

Average Permeability Millidarcys .....

175.5

Average Percent Porosity .....

24.3

Average Percent Oil Saturation .....

54.8

Average Percent Water Saturation .....

12.2

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

1,030.

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

33,055.

## OILFIELD RESEARCH LABORATORIES

LOGName Mid-States Energy Corp. Lease Forest-Edwards Well No. 3

Depth Interval, Feet	Description
548.0 - 549.0	Grayish black very shaly sandstone.
549.0 - 554.7	Black slightly carbonaceous sandstone.
554.7 - 555.4	Gray and brown laminated shale and sandstone.
555.4 - 556.6	Dark brown sandstone.
556.6 - 557.2	Gray and black laminated shale and sandstone slightly carbonaceous.
557.2 - 560.3	Black slightly carbonaceous sandstone.
560.3 - 560.8	Gray slightly sandy shale.
560.8 - 563.0	Black slightly carbonaceous sandstone.
563.0 - 563.6	Grayish black slightly carbonaceous shaly sandstone.
563.6 - 566.6	Black slightly carbonaceous sandstone.
566.6 - 567.0	Gray shale.
567.0 - 571.6	Black slightly carbonaceous sandstone.
571.6 - 572.0	Gray and black slightly carbonaceous laminated shale and sandstone.
572.0 - 572.5	Black slightly carbonaceous sandstone.
572.5 - 573.0	Dark brown sandstone with shale partings.
573.0 - 576.0	Black slightly carbonaceous sandstone.
576.0 - 576.6	Black slightly carbonaceous sandstone with coal partings.
576.6 - 576.8	Coal.
576.8 - 579.8	Black slightly carbonaceous sandstone.
579.8 - 581.0	Brownish black slightly carbonaceous sandstone with coal partings.
581.0 - 583.0	Brownish black slightly carbonaceous shaly sandstone with coal partings.
583.0 - 585.0	Brownish black slightly carbonaceous sandstone with coal partings.
585.0 - 586.0	Gray shale.

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Mid-States Energy Corporation Lease Forest-Edwards Well No. 3

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			Ft.	Cum. Ft.		
1	549.6	19.8	53	14	814	145.	1.0	1.0	814	145.00
2	550.4	24.0	55	7	1024	203.	1.0	2.0	1024	203.00
3	551.5	24.5	59	6	1121	226.	1.0	3.0	1121	226.00
4	552.6	24.9	52	7	1005	212.	1.0	4.0	1005	212.00
5	553.6	22.3	56	8	969	90.	1.0	5.0	969	90.00
6	554.5	23.7	62	7	1140	101.	0.7	5.7	798	70.70
7	555.5	23.3	49	13	886	108.	0.6	6.3	532	64.80
8	556.5	22.5	44	12	768	158.	0.6	6.9	461	94.80
9	557.6	23.4	55	7	999	103.	1.0	7.9	999	103.00
10	558.4	24.3	56	10	1056	203.	0.7	8.6	739	142.10
11	559.5	23.1	52	14	932	90.	0.7	9.3	652	63.00
12	560.2	25.2	51	10	997	181.	0.7	10.0	698	126.70
13	561.5	24.2	55	9	1033	195.	1.2	11.2	1240	234.00
14	562.8	23.0	57	11	1017	181.	1.0	12.2	1017	181.00
15	563.7	26.9	44	27	918	664.	0.5	12.7	459	332.00
16	564.5	25.5	55	10	1088	463.	0.5	13.2	544	231.50
17	565.4	25.5	61	8	1207	346.	1.0	14.2	1207	346.00
18	566.5	24.2	62	4	1164	253.	1.0	15.2	1164	253.00
19	567.5	26.2	50	8	1016	509.	1.0	16.2	1016	509.00
20	568.4	25.8	57	5	1141	456.	0.7	16.9	799	319.20
21	569.5	26.1	46	14	931	296.	1.0	17.9	931	296.00
22	570.6	23.2	56	17	1008	130.	1.0	18.9	1008	130.00
23	571.3	23.7	49	9	901	200.	0.9	19.8	811	180.00
24	572.3	22.7	64	9	1127	72.	0.5	20.3	564	36.00
25	573.5	23.3	52	13	940	121.	1.0	21.3	940	121.00
26	574.5	26.2	56	15	1138	184.	1.0	22.3	1138	184.00
27	575.5	23.3	65	15	1175	84.	1.0	23.3	1175	84.00
28	576.3	28.4	49	15	1080	163.	0.6	23.9	648	97.80
29	577.7	30.7	46	7	1096	34.	1.0	24.9	1096	34.00
30	578.4	23.6	65	11	1190	105.	1.0	25.9	1190	105.00
31	579.3	23.5	62	11	1130	280.	1.0	26.9	1130	280.00

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## RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Mid-States Energy Corporation Lease Forest-Edwards Well No. 3

Page 2

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			Ft.	Cum. Ft.		
32	580.6	25.7	55	17	1097	37.	1.2	28.1	1316	44.40
33	581.5	19.2	57	28	849	2.8	1.0	29.1	849	2.80
34	582.5	17.0	54	30	712	6.1	1.0	30.1	712	6.10
35	583.5	26.7	60	19	1243	46.	1.0	31.1	1243	46.00
36	584.5	32.1	42	14	1046	39.	1.0	32.1	1046	39.00

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Mid-States Energy Corporation Lease Forest-Edwards Well No. 3

Permeability  
Capacity  
Ft. x Md.

Average  
Permeability,  
Millidarcys

Feet of Core  
Analyzed

Depth Interval,  
Feet

5494.60  
138.30  
5632.90

204.3  
26.6  
175.5

26.9  
5.2  
32.1

549.0 - 579.8  
579.8 - 585.0  
549.0 - 585.0

Total Oil  
Content  
Bbls./Acre

Average  
Oil Content  
Bbl./A. Ft.

Average  
Percent Water  
Saturation

Average  
Percent Oil  
Saturation

Average  
Percent  
Porosity

Feet of Core  
Analyzed

Depth Interval,  
Feet

27,889  
5,166  
33,055

1,037  
993  
1,030

10.4  
21.4  
12.2

55.0  
53.7  
54.8

24.4  
24.2  
24.3

26.9  
5.2  
32.1

549.0 - 579.8  
579.8 - 585.0  
549.0 - 585.0

PERMEABILITY, IN MILLIDARCS

500  
400  
300  
200  
100

664

WATER SAT., PERCENT  
OIL SAT., PERCENT

90  
70  
50  
30  
10

548

549

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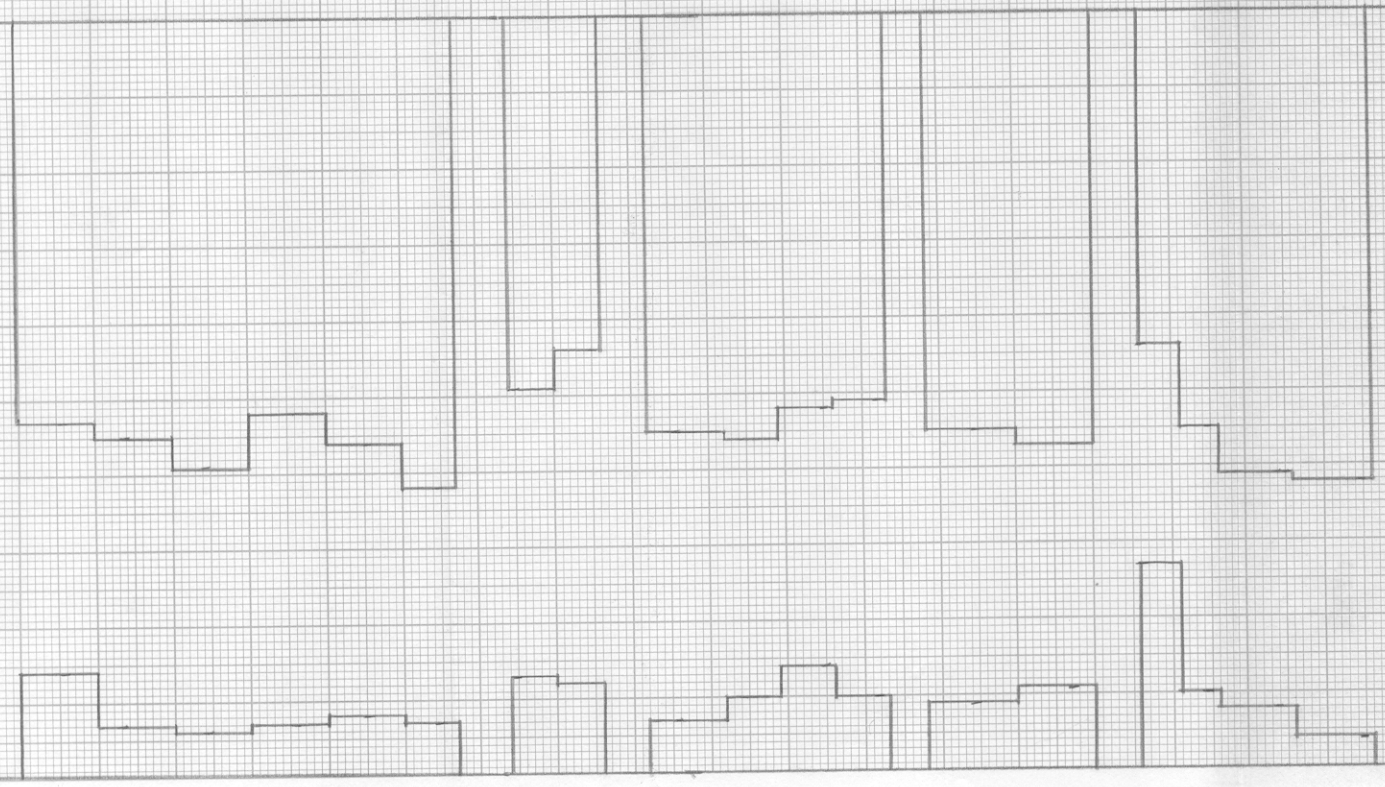
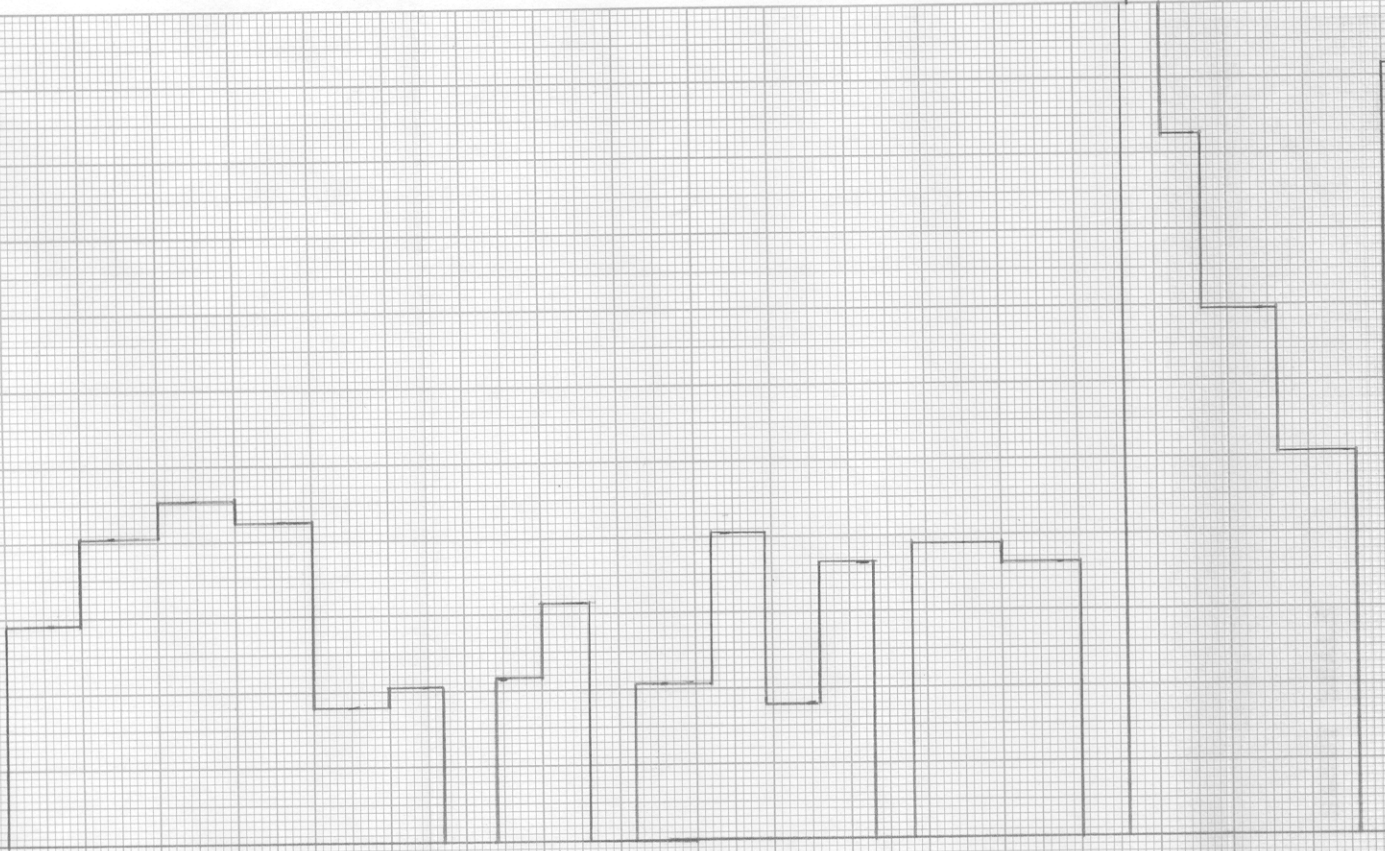
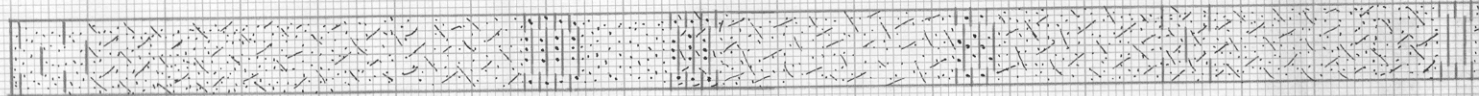
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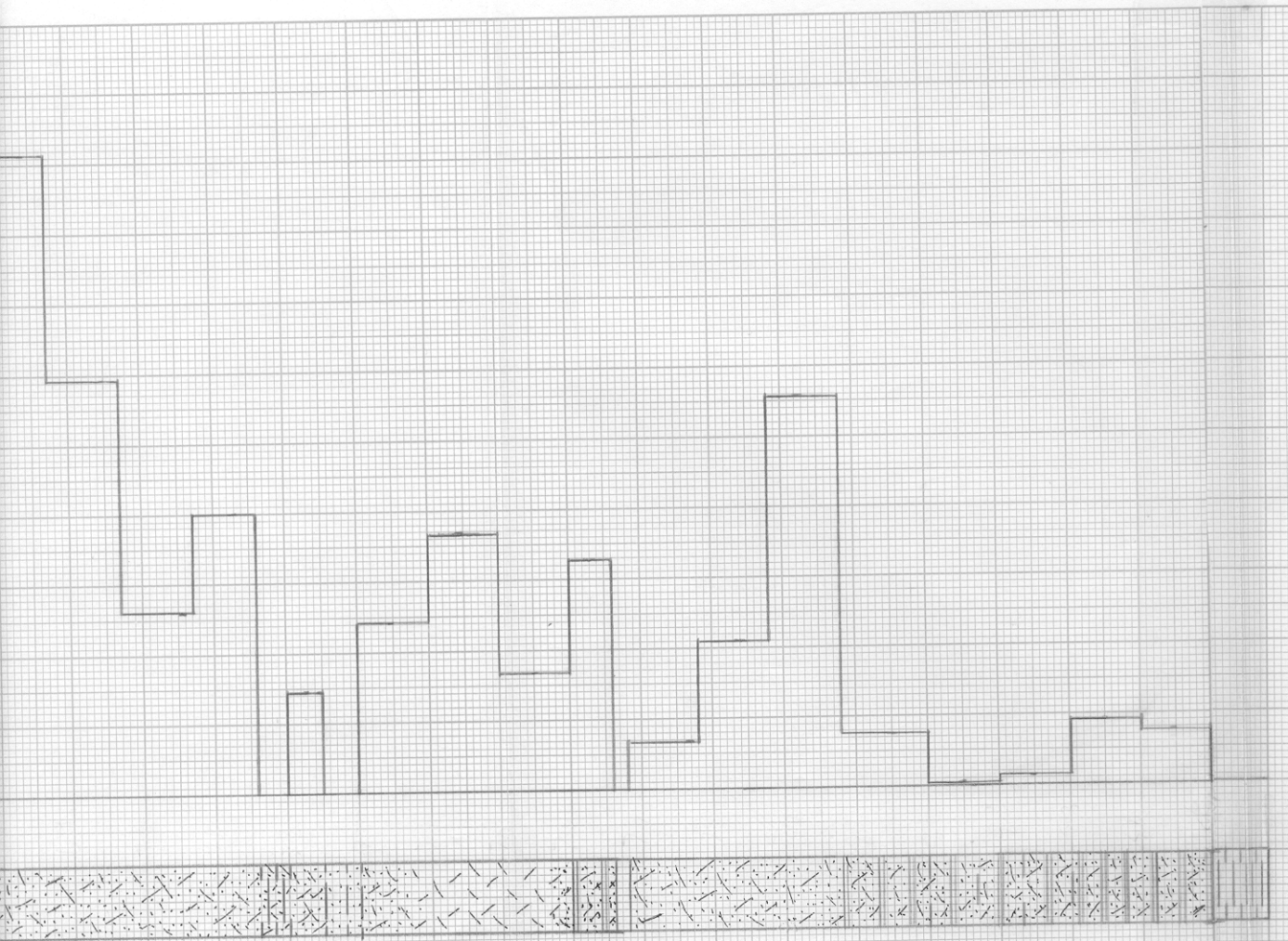
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SANDY SHALE

SANDSTONE WITH SHALE PARTINGS

KEY:

SANDSTONE



KEY:		SANDY SHALE
	SANDSTONE	SANDSTONE WITH SHALE PARTINGS
	CARBONACEOUS SANDSTONE	CARBONACEOUS SHALY SANDSTONE
	SHALY SANDSTONE	LAMINATED SANDSTONE AND SHALE
	SHALE	CARBONACEOUS LAMINATED SANDSTONE AND SHALE
	COAL	CARBONACEOUS SANDSTONE WITH COAL PARTINGS
		CARBONACEOUS SHALY SANDSTONE WITH COAL PARTINGS

# MID-STATES ENERGY CORPORATION

FOREST - EDWARDS LEASE

MIAMI COUNTY, KANSAS

WELL NO. 3

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCY
549.0 - 579.8	26.9	24.4	55.0	10.4	204.3
579.8 - 585.0	5.2	24.2	53.7	21.4	26.6
549.0 - 585.0	32.1	24.3	54.8	12.2	175.5

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 CHANUTE, KANSAS  
 NOVEMBER, 1981 PDC