

OILFIELD RESEARCH LABORATORIES

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November 16, 1982

Triple-I Energy Corporation
8100 Marty, Suite 117
Overland Park, Kansas 66204

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Nolin Lease, Well No. 28, located in Linn County, Kansas and submitted to our laboratory on November 10, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/rmc

5 c to Overland Park, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Triple-I Energy Corporation Lease Nolin Well No. 28
 Location _____
 Section 23 Twp. 19S Rge. 22E County Linn State Kansas

Elevation, Feet

Name of Sand.....	Bartlesville
Top of Core	647.0
Bottom of Core	670.0
Top of Sand (Tested)	647.4
Bottom of Sand	669.6
Total Feet of Permeable Sand	18.0
Total Feet of Floodable Sand	16.6

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 20	3.1	3.1
20 - 40	1.8	4.9
40 - 60	1.2	6.1
60 - 100	6.1	12.2
100 - 125	3.2	15.4
125 - 176	2.6	18.0

Average Permeability Millidarcys	76.3
Average Percent Porosity	20.7
Average Percent Oil Saturation	46.7
Average Percent Water Saturation	28.2
Average Oil Content, Bbls./A. Ft.	754.
Total Oil Content, Bbls./Acre	13,569.
Average Percent Oil Recovery by Laboratory Flooding Tests	14.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	234.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	3,882.

See "Calculated Recovery"
Section

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The core was sampled and the samples sealed in plastic bags by a representative of the client. Air and a water mist were used as drilling fluids.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
647.0 - 647.3	Brown sandstone.
647.3 - 647.4	Gray shale.
647.4 - 648.4	Brown sandstone.
648.4 - 649.0	Alternate layers gray shale and brown sandstone.
649.0 - 649.9	Gray shale.
649.9 - 650.2	Brown sandstone.
650.2 - 650.4	Gray shale.
650.4 - 651.4	Brown sandstone.
651.4 - 651.9	Gray and brown alternate layers shale and sandstone.
651.9 - 652.1	Gray shale.
652.1 - 652.3	Brown sandstone.
652.3 - 653.0	Alternate layers gray shale and brown sandstone.
653.0 - 654.1	Brown sandstone.
654.1 - 654.3	Gray shale.
654.3 - 655.8	Brown sandstone.
655.8 - 657.0	Brown slightly calcareous sandstone.
657.0 - 658.5	Gray limestone.
658.5 - 659.0	Brown sandstone.
659.0 - 659.7	Brown slightly shaly sandstone.
659.7 - 668.0	Brown sandstone.

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<u>Depth Interval, Feet</u>	<u>Description</u>
668.0 - 668.8	Grayish brown slightly calcareous very shaly sandstone.
668.8 - 669.0	Gray shale.
669.0 - 669.6	Grayish brown slightly calcareous very shaly sandstone.
669.6 - 670.0	Black limestone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 3,882 barrels of oil per acre was obtained from 16.6 feet of sand. The weighted average percent oil saturation was reduced from 47.5 to 33.5, or represents an average recovery of 14.0 percent. The weighted average effective permeability of the samples is 8.59 millidarcys, while the average initial fluid production pressure is 16.8 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 21 samples tested, 19 produced water and oil, and 1 produced water only. This indicates that approximately 90 percent of the sand represented by these samples is floodable pay sand.

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CALCULATED RECOVERY

It would appear from a study of the core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 6,600 barrels of oil per acre. This is an average recovery of 398 barrels per acre foot from 16.6 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	15.0
Average porosity, percent	21.6
Oil saturation after flooding, percent	33.5
Performance factor, percent, estimated	50.0
Net floodable sand, feet	16.6

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Triple-I Energy Corporation Lease Nolin Well No. 28

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	647.5	24.1	34	28	62	636	163.	1.0	1.0	636	163.00
2	648.7	21.5	38	27	65	634	27.	0.6	1.6	380	16.20
3	650.6	24.1	44	14	58	823	110.	0.5	2.1	412	55.00
4	651.3	22.9	40	37	77	710	127.	0.5	2.6	355	63.50
5	652.8	21.7	41	26	67	690	108.	0.7	3.3	483	75.60
6	653.6	25.8	63	16	79	1261	175.	1.1	4.4	1387	192.50
7	654.6	21.5	55	27	82	917	43.	0.7	5.1	642	30.10
8	655.6	21.9	48	28	76	816	76.	0.8	5.9	653	60.80
9	656.5	15.3	40	30	70	475	32.	1.2	7.1	570	38.40
10	658.7	22.5	66	19	85	1152	41.	0.5	7.6	576	20.50
11	659.6	16.9	56	31	87	734	8.2	0.7	8.3	514	5.74
12	660.5	22.5	53	29	82	925	76.	1.3	9.6	1203	98.80
13	661.4	22.3	47	28	75	813	105.	1.0	10.6	813	105.00
14	662.5	21.3	38	40	78	628	63.	1.0	11.6	628	63.00
15	663.5	23.2	40	31	71	720	121.	1.0	12.6	720	121.00
16	664.5	18.1	64	22	86	899	19.	1.0	13.6	899	19.00
17	665.6	23.4	44	28	72	799	72.	1.0	14.6	799	72.00
18	666.5	20.2	39	33	72	611	99.	1.0	15.6	611	99.00
19	667.6	20.8	49	18	67	791	74.	1.0	16.6	791	74.00
20	668.3	9.6	41	54	95	305	0.21	0.8	17.4	244	0.17
21	669.5	13.9	39	21	60	421	0.76	0.6	18.0	253	0.46

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Triple-I Energy Corporation		Lease	Nolin	Well No.		28
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
647.4 - 657.0	7.1	21.8	45.3	25.7	97.9	695.10		
658.5 - 669.6	10.9	20.0	47.6	29.8	62.3	678.67		
647.4 - 669.6	18.0	20.7	46.7	28.2	76.3	1373.77		
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
647.4 - 657.0	7.1	21.8	45.3	25.7	97.9	695.10	777	5,518
658.5 - 669.6	10.9	20.0	47.6	29.8	62.3	678.67	739	8,051
647.4 - 669.6	18.0	20.7	46.7	28.2	76.3	1373.77	754	13,569

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Triple-I Energy Corporation Lease Nolin Well No. 28

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	647.5	24.2	34	638	4	75	30	52	456	21.32	10
2	648.7	21.3	38	628	7	116	31	38	24	0.50	30
3	650.6	24.0	44	819	14	261	30	41	410	9.40	15
4	651.3	23.1	40	717	13	233	27	53	324	7.40	15
5	652.8	21.8	41	693	13	220	28	60	344	12.20	15
6	653.6	25.9	63	1266	19	382	44	53	260	13.24	10
7	654.6	21.6	55	922	18	302	37	46	78	1.40	20
8	655.6	21.8	48	812	19	321	29	64	334	4.80	15
9	656.5	15.5	40	481	7	84	37	38	44	1.20	25
10	658.7	22.4	66	1147	27	469	39	48	64	1.30	20
11	659.6	17.0	56	739	18	237	38	51	316	7.10	15
12	660.5	22.6	53	929	16	281	37	57	422	9.30	15
13	661.4	22.4	47	817	15	261	32	53	354	12.99	15
14	662.5	21.5	38	634	7	117	31	54	326	7.60	20
15	663.5	23.3	40	723	10	181	30	53	260	14.24	15
16	664.5	18.0	64	894	28	391	36	53	148	3.30	15
17	665.6	23.4	44	799	10	182	34	54	350	14.19	15
18	666.5	20.4	39	617	10	158	29	55	274	12.22	15
19	667.6	20.8	49	791	18	290	31	52	38	0.90	20
20	668.3	9.1	42	297	0	0	42	56	10	0.15	30
21	669.5	14.4	38	425	0	0	38	22	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.

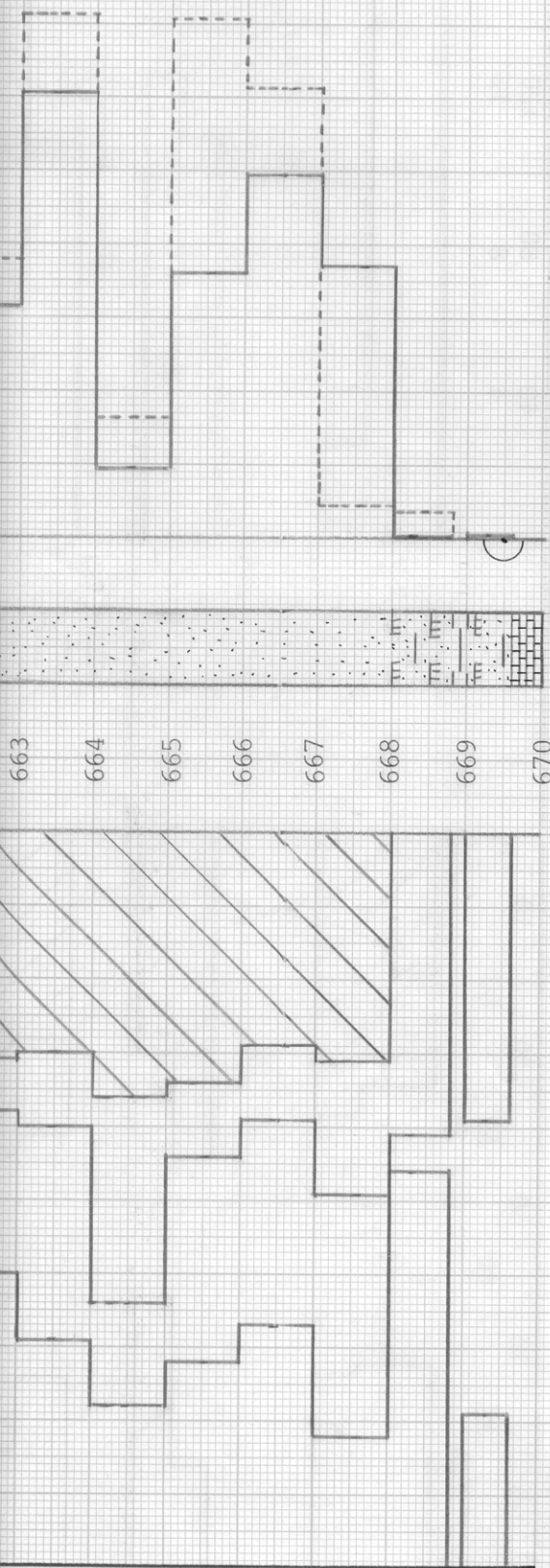
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SUMMARY OF LABORATORY FLOODING TESTS

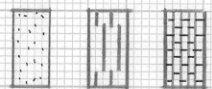
TABLE V

Company	Triple-I Energy Corporation	Lease	Nolin	Well No.	28
Depth Interval, Feet	647.4 - 657.0	658.5 - 669.6	647.4 - 669.6		
Feet of Core Analyzed	7.1	9.5	16.6		
Average Percent Porosity	21.9	21.3	21.6		
Average Percent Original Oil Saturation	46.0	48.7	47.5		
Average Percent Oil Recovery	12.4	15.3	14.0		
Average Percent Residual Oil Saturation	33.6	33.4	33.5		
Average Percent Residual Water Saturation	49.5	53.5	51.7		
Average Percent Total Residual Fluid Saturation	83.1	86.9	85.2		
Average Original Oil Content, Bbls./A. Ft.	779.	797.	790.		
Average Oil Recovery, Bbls./A. Ft.	216.	247.	234.		
Average Residual Oil Content, Bbls./A. Ft.	563.	550.	556.		
Total Original Oil Content, Bbls./Acre	5,533.	7,573.	13,106.		
Total Oil Recovery, Bbls./Acre	1,536.	2,346.	3,882.		
Total Residual Oil Content, Bbls./Acre	3,997.	5,227.	9,224.		
Average Effective Permeability, Millidarcys	8.36	8.75	8.59		
Average Initial Fluid Production Pressure, p.s.i.	17.2	16.5	16.8		

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



KEY:



SANDSTONE
SHALE
LIMESTONE

CALCAREOUS SANDSTONE

SHALY CALCAREOUS SANDSTONE

SHALY SANDSTONE

ALTERNATE LAYERS OF SANDSTONE AND SHALE

IMPERMEABLE TO WATER

FLOODPOT RESIDUAL OIL SATURATION

TRIPLE I ENERGY CORPORATION

NOLIN LEASE

WELL NO. 28

LINN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY PERCENT	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLs. / ACRE
647.4 - 657.0	7.1	21.8	45.3	25.7	97.9	
658.5 - 669.6	10.9	20.0	47.6	29.8	62.3	
647.4 - 669.6	18.0	20.7	46.7	28.2	76.3	6600 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS