

TRIPLE-I ENERGY CORPORATION

CORE ANALYSIS REPORT

GOOD LEASE

WELL NO. 13-W

MIAMI COUNTY, KANSAS

OILFIELD RESEARCH LABORATORIES

536 N. HIGHLAND

CHANUTE, KANSAS



OILFIELD RESEARCH LABORATORIES

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

September 1, 1983

Triple-I Energy Corporation
6600 College Boulevard
Suite 310
Overland Park, Kansas 66211

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Good Lease, Well No. 13-W, located in Miami County, Kansas and submitted to our laboratory on August 20, 1983.

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 Good Well No. 13-W
 Location 1650' NSL & 1650' WEL, SE $\frac{1}{4}$
 Section 11 Twp. 17S Rge. 24E County Miami State Kansas

Elevation, Feet

Name of Sand **Knobtown**

Top of Core 202.0

Bottom of Core 223.2

Top of Sand 202.0

Bottom of Sand 223.2

Total Feet of Permeable Sand 14.5

Total Feet of Floodable Sand 9.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
15 - 30	4.3	4.3
40 - 60	4.7	9.0
90 - 110	3.9	12.9
120 - 130	0.6	13.5
150 - 160	1.0	14.5

Average Permeability Millidarcys 64.6

Average Percent Porosity 19.5

Average Percent Oil Saturation 32.7

Average Percent Water Saturation 62.0

Average Oil Content, Bbls./A. Ft. 517.

Total Oil Content, Bbls./Acre 9,919.

Average Percent Oil Recovery by Laboratory Flooding Tests 6.9

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. 115.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre 1,045.

Total Calculated Oil Recovery, Bbls./Acre

See "Calculated Recovery"
Section

-2-

The core was sampled and the samples sealed in plastic bags by a representative of the client. Air and water mist were used as a drilling fluid. The core was reported to be from a semi-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
202.0 - 208.9	Brown sandstone with widely scattered fine shale and mica partings.
208.9 - 209.9	Light grayish brown limestone containing a vertical fracture.
209.9 - 210.2	Grayish brown calcareous sandstone containing a vertical fracture.
210.2 - 211.2	Brown calcareous sandstone.
211.2 - 212.0	Brown slightly calcareous sandstone.
212.0 - 214.0	Dark gray very slightly carbonaceous sandstone.
214.0 - 214.7	Grayish black very slightly carbonaceous sandstone.
214.7 - 215.4	Gray shale.
215.4 - 217.0	Brown slightly calcareous sandstone.
217.0 - 218.1	Brown very slightly calcareous sandstone with scattered shale inclusions.
218.1 - 218.5	Brown very slightly calcareous sandstone with scattered shale and mica partings.
218.5 - 219.6	Light grayish brown very shaly sandstone.
219.6 - 223.2	Gray very shaly sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,045 barrels of oil per acre was obtained from 9.1 feet of sand. The weighted average percent oil saturation was reduced from 41.4 to 34.5, or represents an average recovery of 6.9 percent. The weighted average effective permeability of the samples is 1.31 millidarcys, while the average initial fluid production pressure is 32.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 20 samples tested, 10 produced water and oil and 4 produced water only. This indicates that approximately 50 percent of the sand represented by these samples is floodable pay sand.

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 1,850 barrels of oil per acre. This is an average recovery of 203 barrels per acre foot from 9.1 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.02
Reservoir water saturation, percent, estimated	40.0
Average porosity, percent	21.5
Oil saturation after flooding, percent	34.5
Performance factor, percent, estimated	50.0
Net floodable sand, feet	9.1

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Triple-I Energy Corporation Lease Good Well No. 13-W

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	202.5	19.3	37	60	97	554	17.	1.0	1.0	554	17.00
2	203.5	19.3	42	56	98	629	22.	1.0	2.0	629	22.00
3	204.5	21.4	41	55	96	681	44.	1.0	3.0	681	44.00
4	205.5	20.9	39	57	96	632	101.	1.0	4.0	632	101.00
5	206.6	20.4	37	60	97	586	44.	1.0	5.0	586	44.00
6	207.5	20.5	41	48	89	652	92.	1.0	6.0	652	92.00
7	208.5	19.8	48	49	97	737	26.	0.9	6.9	663	23.40
8	210.5	16.3	50	45	95	632	20.	1.0	7.9	632	20.00
9	211.5	21.0	38	51	89	619	97.	0.8	8.7	495	77.60
10	212.5	22.8	41	51	92	725	49.	1.0	9.7	725	49.00
11	213.5	21.2	46	51	97	757	44.	1.0	10.7	757	44.00
12	214.4	21.9	48	50	98	816	58.	0.7	11.4	571	40.60
13	215.6	21.2	35	56	91	576	127.	0.6	12.0	346	76.20
14	216.5	22.2	36	48	84	620	158.	1.0	13.0	620	158.00
15	217.6	21.8	41	53	94	693	108.	1.1	14.1	762	118.80
16	218.4	19.4	40	56	96	602	21.	0.4	14.5	241	8.40
17	219.5	16.4	15	83	98	191	Imp.	1.1	15.6	210	0.00
18	220.5	16.9	5	91	96	66	Imp.	1.0	16.6	66	0.00
19	221.5	15.4	3	92	95	36	Imp.	1.0	17.6	36	0.00
20	222.5	16.3	3	94	97	38	Imp.	1.6	19.2	61	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Triple-I Energy Corporation Lease Good Well No. 13-W

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
202.0 - 218.1	14.1	65.8	927.60
218.1 - 223.2	0.4	21.0	8.40
202.0 - 223.2	14.5	64.6	936.00

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
202.0 - 218.1	14.1	20.6	41.4	52.7	660	9,305
218.1 - 223.2	5.1	16.5	8.9	87.7	120	614
202.0 - 223.2	19.2	19.5	32.7	62.0	517	9,919

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Triple-I Energy Corporation Lease Good Well No. 13-W

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.			
1	202.5	19.8	36	553	0	0	36	61	553	8	0.08	50
2	203.5	19.3	42	629	0	0	42	57	629	28	0.50	40
3	204.5	21.9	40	680	0	0	40	56	680	0	Imp.	-
4	205.5	21.4	39	647	10	166	29	69	481	142	2.32	25
5	206.6	20.9	37	600	0	0	37	61	600	22	0.37	40
6	207.5	20.9	41	665	5	81	36	57	584	62	1.20	30
7	208.5	20.0	48	745	6	93	42	56	652	20	0.83	25
8	210.5	16.8	49	639	0	0	49	48	639	12	0.22	50
9	211.5	21.5	38	634	5	83	33	65	551	116	2.40	30
10	212.5	22.5	41	716	7	122	34	61	594	96	1.72	30
11	213.5	21.2	46	757	13	214	33	65	543	14	0.33	40
12	214.4	21.6	48	804	8	134	40	59	670	26	0.33	35
13	215.6	21.4	35	581	2	33	33	62	548	174	3.52	30
14	216.5	22.5	36	628	5	87	31	60	541	34	0.67	45
15	217.6	21.8	41	693	6	101	35	61	592	40	0.60	30
16	218.4	19.6	40	608	0	0	40	57	608	0	Imp.	-
17	219.5	15.9	16	197	0	0	16	82	197	0	Imp.	-
18	220.5	17.1	5	66	0	0	5	91	66	0	Imp.	-
19	221.5	15.9	3	37	0	0	3	93	37	0	Imp.	-
20	222.5	16.8	3	39	0	0	3	94	39	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.

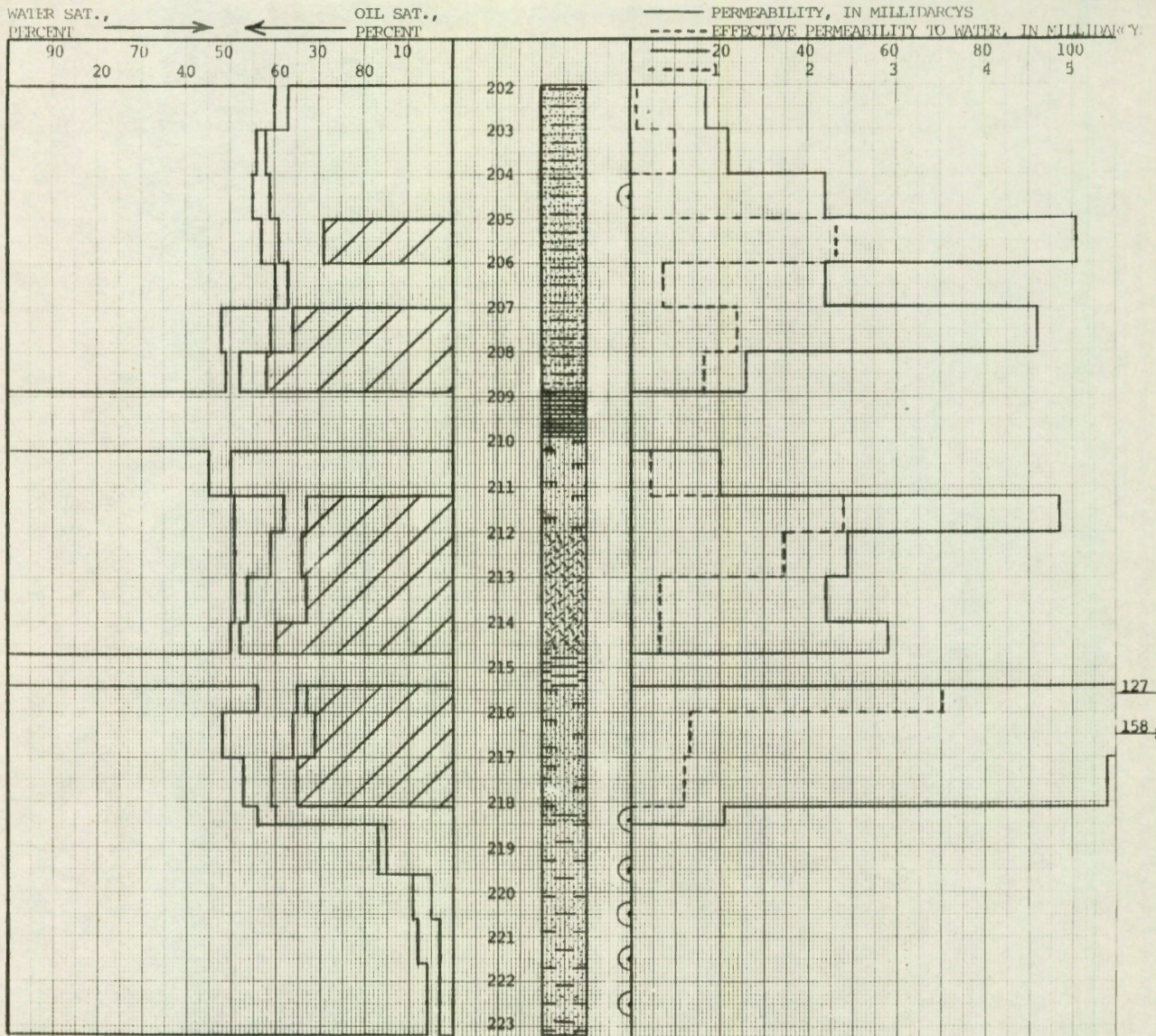
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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company <u>Triple-I Energy Corporation</u>	Lease <u>Good</u>	Well No. <u>13-W</u>
Depth Interval, Feet	202.0 - 218.1	
Feet of Core Analyzed	9.1	
Average Percent Porosity	21.5	
Average Percent Original Oil Saturation	41.4	
Average Percent Oil Recovery	6.9	
Average Percent Residual Oil Saturation	34.5	
Average Percent Residual Water Saturation	61.5	
Average Percent Total Residual Fluid Saturation	96.0	
Average Original Oil Content, Bbls./A. Ft.	689.	
Average Oil Recovery, Bbls./A. Ft.	115.	
Average Residual Oil Content, Bbls./A. Ft.	574.	
Total Original Oil Content, Bbls./Acre	6,265.	
Total Oil Recovery, Bbls./Acre	1,045.	
Total Residual Oil Content, Bbls./Acre	5,220.	
Average Effective Permeability, Millidarcys	1.31	
Average Initial Fluid Production Pressure, p.s.i.	32.0	

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



- KEY:
- SHALE
 - SHALY SANDSTONE
 - CALCAREOUS SANDSTONE
 - CARBONACEOUS SANDSTONE
 - IMPERMEABLE TO WATER
 - SANDSTONE WITH SHALE AND MICA PARTINGS
 - LIMESTONE
 - CALCAREOUS SANDSTONE WITH SHALE INCLUSIONS
 - CALCAREOUS SANDSTONE WITH SHALE AND MICA PARTINGS
 - FORMATION CONTAINS VERTICAL FRACTURE
 - FLOODPOT RESIDUAL OIL SATURATION

TRIPLE I ENERGY CORPORATION

GOOD LEASE

MIAMI COUNTY, KANSAS

WELL NO. 13-W

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLs. / ACRE
202.0 - 218.1	14.1	20.6	41.4	52.7	65.8	
218.1 - 223.2	5.1	16.5	8.9	87.7	21.0	
202.0 - 223.2	19.2	19.5	32.7	62.0	64.6	1850 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
SEPTEMBER, 1983

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