



OILFIELD RESEARCH LABORATORIES

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

July 20, 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 Caylor Lease, Well No. 21, located in Franklin County, Kansas and submitted to our laboratory on July 15, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/dlb

4 c to Overland Park, Kansas
1 c to L & B Leasing
Hutchinson, Kansas

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Triple-I Energy Corporation Lease Caylor Well No. 21

Location _____

Section 33 Twp. 17S Rge. 21E County Franklin State Kansas

Elevation, Feet	
Name of Sand.....	Cattleman
Top of Core	700.0
Bottom of Core	735.0
Top of Sand	708.2
Bottom of Sand	729.6
Total Feet of Permeable Sand	20.4
Total Feet of Floodable Sand	12.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 2	5.9	5.9
5 - 10	2.0	7.9
15 - 25	2.8	10.7
25 - 35	5.7	16.4
35 - 63	4.0	20.4

Average Permeability Millidarcys	20.6
Average Percent Porosity	19.3
Average Percent Oil Saturation	47.0
Average Percent Water Saturation.....	28.1
Average Oil Content, Bbls./A. Ft.	712.
Total Oil Content, Bbls./Acre.....	15,246.
Average Percent Oil Recovery by Laboratory Flooding Tests.....	8.4
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	134.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,617.
Total Calculated Oil Recovery, Bbls./Acre.....	

See "Calculated Recovery"
Section

The core was sampled by a representative of Oilfield Research Laboratories. Natural mud and 1% KCl 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>
700.0 - 708.2	Gray shale.
708.2 - 710.2	Grayish brown very shaly sandstone.
710.2 - 711.4	Grayish brown shaly sandstone.
711.4 - 723.9	Dark brown sandstone.
723.9 - 725.0	Brown shaly sandstone.
725.0 - 726.3	Dark brown slightly shaly sandstone.
726.3 - 727.0	Dark brown shaly sandstone.
727.0 - 727.8	Grayish black shaly slightly carbonaceous sandstone.
727.8 - 729.6	Grayish black very shaly slightly carbonaceous sandstone.
729.6 - 735.0	Gray shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,617 barrels of oil per acre was obtained from 12.1 feet of sand. The weighted average percent oil saturation was reduced from 48.7 to 40.3, or represents an average recovery of 8.4 percent. The weighted average effective permeability of the samples is 0.95 millidarcys, while the average initial fluid production pressure is 27.9 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 22 samples tested, 12 produced water and oil, and 2 produced water only. This indicates that approximately 55 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 4,320 barrels of oil per acre. This is an average recovery of 357 barrels per acre foot from 12.1 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	15.0
Average porosity, percent	20.6
Oil saturation after flooding, percent	40.3
Performance factor, percent, estimated	55.0
Net floodable sand, feet	12.1

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Triple-I Energy Corporation Lease Caylor Well No. 21

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbbs. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	708.3	13.1	21	77	98	213	Imp.	1.0	1.0	213	0.00
2	709.5	15.1	30	57	87	351	0.64	1.0	2.0	351	0.64
3	710.4	12.6	41	50	91	401	1.6	1.2	3.2	481	1.92
4	711.5	16.8	67	28	95	873	20.	0.8	4.0	698	16.00
5	712.5	20.4	46	25	71	728	28.	0.7	4.7	510	19.60
6	713.5	19.5	47	18	65	711	17.	1.0	5.7	711	17.00
7	714.5	20.1	53	20	73	827	27.	1.0	6.7	827	27.00
8	715.5	20.1	47	21	68	733	15.	1.0	7.7	733	15.00
9	716.4	21.1	44	23	67	720	27.	1.0	8.7	720	27.00
10	717.5	22.1	45	18	63	772	62.	1.0	9.7	772	62.00
11	718.5	21.1	53	17	70	868	39.	1.0	10.7	868	39.00
12	719.5	21.2	45	21	66	740	47.	1.0	11.7	740	47.00
13	720.4	21.4	42	29	71	697	39.	1.0	12.7	697	39.00
14	721.5	21.5	52	17	69	867	31.	1.0	13.7	867	31.00
15	722.6	21.4	50	19	69	830	33.	1.0	14.7	830	33.00
16	723.4	22.3	45	22	67	779	28.	1.0	15.7	779	28.00
17	724.5	19.0	63	28	91	929	1.6	1.1	16.8	1022	1.76
18	725.4	20.4	40	27	67	633	7.2	1.3	18.1	823	9.36
19	726.5	20.8	60	22	82	968	5.2	0.7	18.8	678	3.64
20	727.4	19.5	48	19	67	726	1.2	0.8	19.6	581	0.96
21	728.5	18.5	56	27	83	804	0.82	0.8	20.4	643	0.66
22	729.3	18.1	50	24	74	702	0.55	1.0	21.4	702	0.55

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Triple-I Energy Corporation	Lease	Caylor	Well No.		
				21		
Depth Interval, Feet	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
708.2 - 712.2	708.2 - 712.2	3.0	6.2	18.56		
712.2 - 717.9	712.2 - 717.9	5.7	29.4	167.60		
717.9 - 726.3	717.9 - 726.3	8.4	27.2	228.12		
726.3 - 729.6	726.3 - 729.6	3.3	1.8	5.81		
708.2 - 729.6	708.2 - 729.6	20.4	20.6	420.09		
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Ebl./A. Ft.	Total Oil Content Bbls./Acre
708.2 - 712.2	4.0	14.2	38.5	54.1	436	1,743
712.2 - 717.9	5.7	20.6	47.1	20.6	750	4,273
717.9 - 726.3	8.4	21.0	48.6	22.7	789	6,626
726.3 - 729.6	3.3	19.1	53.1	23.1	789	2,604
708.2 - 729.6	21.4	19.3	47.0	28.1	712	15,246

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Well No. 21

Lease Caylor

Company Triple-I Energy Corporation

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.
			%	Bbbs./A. Ft.	%	Bbbs./A. Ft.	% Oil	% Water			
1	708.3	13.6	20	211	0	0	20	78	0	Imp.	-
2	709.5	15.0	30	349	0	0	30	58	0	Imp.	-
3	710.4	12.7	41	404	0	0	41	50	0	Imp.	-
4	711.5	16.7	67	868	0	0	67	27	0	Imp.	-
5	712.5	20.3	46	724	16	252	30	55	58	0.97	25
6	713.5	19.4	47	707	13	196	34	48	20	0.30	20
7	714.5	20.1	53	826	14	218	39	43	18	0.22	30
8	715.5	19.9	47	726	12	185	35	53	218	4.12	25
9	716.4	21.0	44	717	13	212	31	51	20	0.30	25
10	717.5	22.1	45	772	11	189	34	43	18	0.22	30
11	718.5	21.2	53	872	10	164	43	44	80	1.42	20
12	719.5	21.3	45	744	3	50	42	46	60	1.12	30
13	720.4	21.8	41	693	0	0	41	40	52	0.90	30
14	721.5	21.6	52	871	4	67	48	38	76	1.05	30
15	722.6	21.3	50	826	2	33	48	30	32	0.50	35
16	723.4	22.2	45	775	0	0	45	38	14	0.45	50
17	724.5	19.1	63	934	4	59	59	33	30	0.45	35
18	725.4	20.5	40	636	3	48	37	43	54	0.82	30
19	726.5	20.4	61	965	0	0	61	21	0	Imp.	-
20	727.4	19.4	48	722	0	0	48	20	0	Imp.	-
21	728.5	18.6	56	808	0	0	56	28	0	Imp.	-
22	729.3	18.4	49	699	0	0	49	25	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

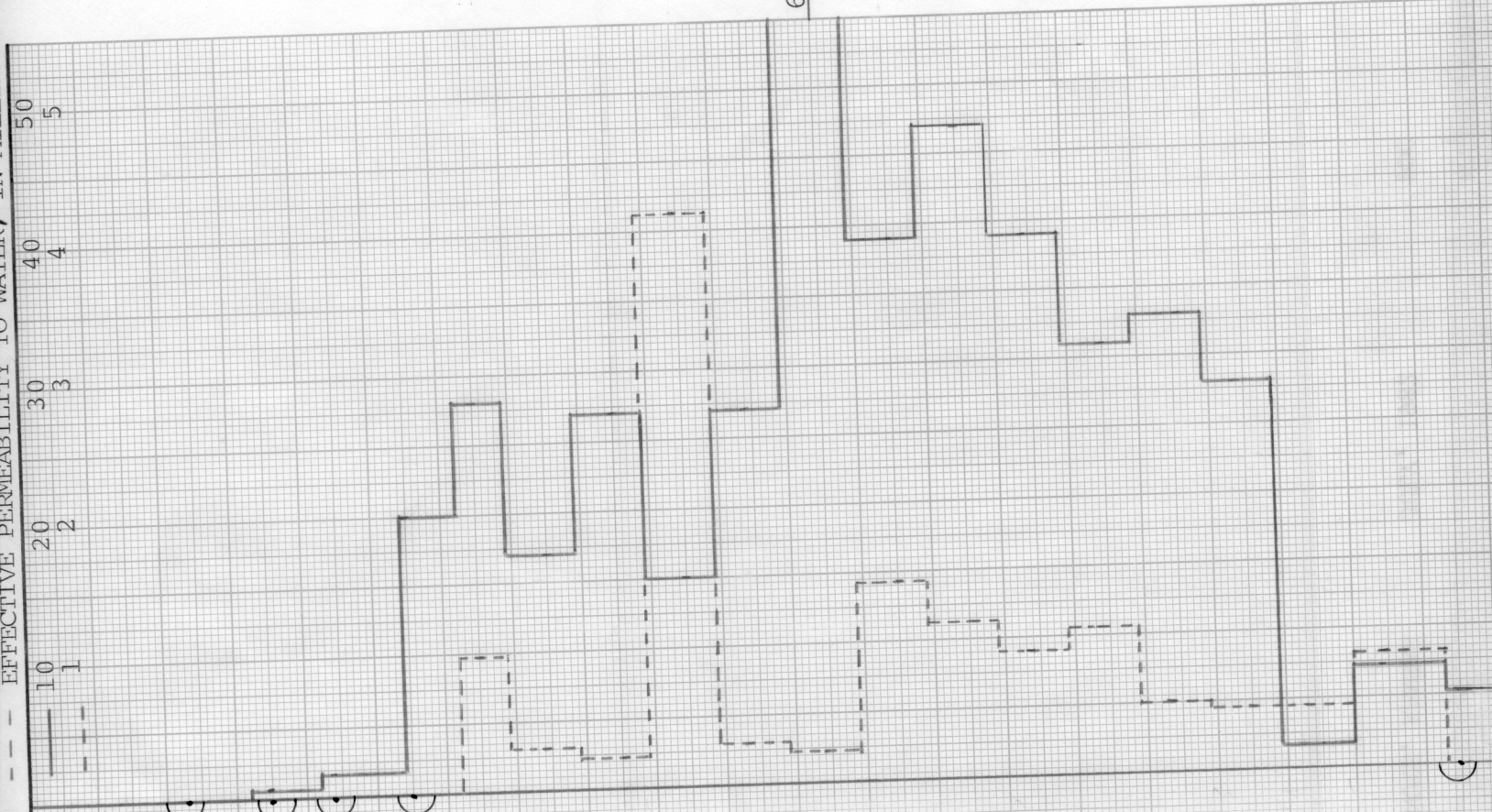
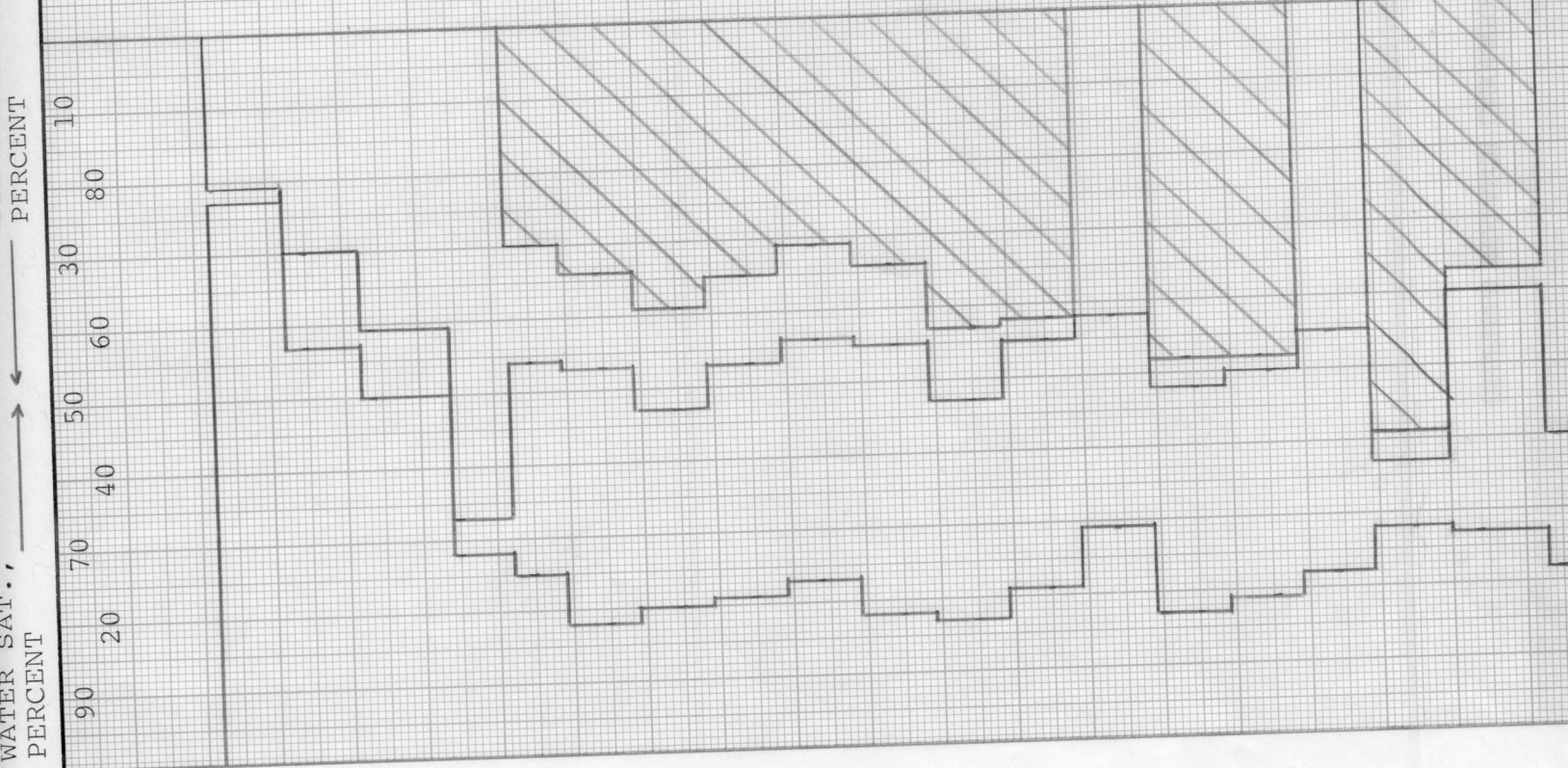
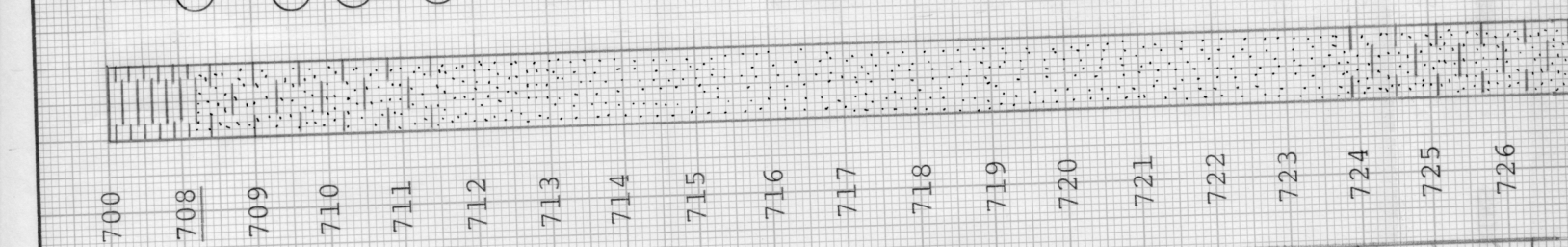
Company	Triple-I Energy Corporation	Lease	Caylor	Well No.	21
Depth Interval, Feet	712.2 - 717.9	717.9 - 726.3	712.2 - 726.3		
Feet of Core Analyzed	5.7	6.4	12.1		
Average Percent Porosity	20.5	20.8	20.6		
Average Percent Original Oil Saturation	47.0	50.2	48.7		
Average Percent Oil Recovery	13.0	4.3	8.4		
Average Percent Residual Oil Saturation	34.0	45.9	40.3		
Average Percent Residual Water Saturation	48.5	39.1	43.5		
Average Percent Total Residual Fluid Saturation	82.5	85.0	83.8		
Average Original Oil Content, Bbls./A. Ft.	746.	870.	779.		
Average Oil Recovery, Bbls./A. Ft.	206.	69.	134.		
Average Residual Oil Content, Bbls./A. Ft.	540.	738.	645.		
Total Original Oil Content, Bbls./Acre	4,254.	5,167.	9,421.		
Total Oil Recovery, Bbls./Acre	1,176.	441.	1,617.		
Total Residual Oil Content, Bbls./Acre	3,078.	4,726.	7,804.		
Average Effective Permeability, Millidarcys	1.02	0.88	0.95		
Average Initial Fluid Production Pressure, p.s.i.	25.8	30.0	27.9		

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

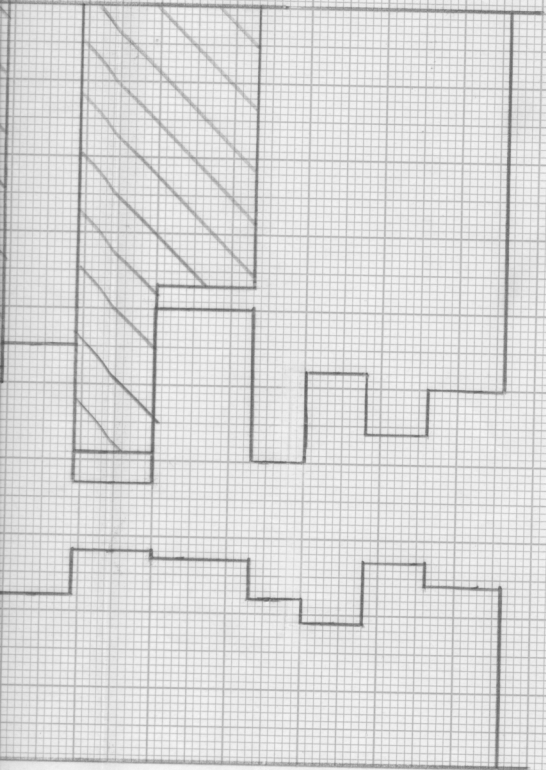
WATER SAL... PERCENT

PERCENT

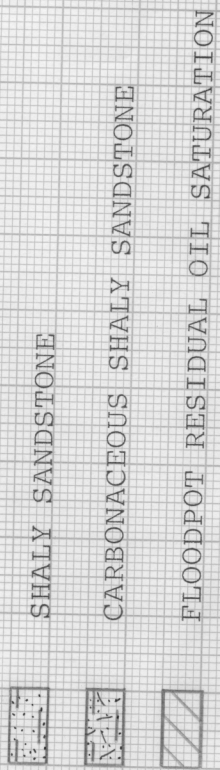
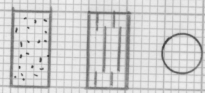
EFFECTIVE PERMEABILITY TO WATER



723
724
725
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735



KEY:



SANDSTONE

SHALE

IMPERMEABLE TO WATER

SHALY SANDSTONE

CARBONACEOUS SHALY SANDSTONE

FLOODING RESIDUAL OIL SATURATION

TRIPLE I ENERGY CORPORATION

CAYLOR LEASE

FRANKLIN COUNTY, KANSAS

WELL NO. 21

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
708.2 - 712.2	4.0	14.2	38.5	54.1	6.2	
712.2 - 717.9	5.7	20.6	47.1	20.6	29.4	
717.9 - 726.3	8.4	21.0	48.6	22.7	27.2	
726.3 - 729.6	3.3	19.1	53.1	23.1	1.8	
708.2 - 729.6	21.4	19.3	47.0	28.1	20.6	4320

(PRIMARY AND WATERFLOODING)