

OILFIELD RESEARCH LABORATORIES

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

January 2, 1980

Rantoul Energy Corporation
P.O. Box 516
Hutchinson, Kansas 67501

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary cores taken from the Carter Lease, Well No. 17, Miami County, Kansas, and submitted to our laboratory on December 6 and 7, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Benjamin R. Pearman

SAM/tem
5 c to Hutchinson, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company <u>Rantoul Energy Corp.</u>	Lease <u>Carter</u>	Well No. <u>17</u>
Location <u>165' EWL & 495' NSL NW SW</u>		
Section <u>25</u>	Twp. <u>17S</u>	Rge. <u>21E</u> County <u>Miami</u> State <u>Kansas</u>
Name of Sand	- - - - -	Peru
Top of Core	- - - - -	378.0
Bottom of Core	- - - - -	395.5
Top of Sand	- - - - -	379.9
Bottom of Sand	- - - - -	395.5
Total Feet of Permeable Sand	- - - - -	13.9
Total Feet of Floodable Sand	- - - - -	9.5
Distribution of Permeable Sand:		
Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 50	1.2	1.2
50 - 100	3.8	5.0
100 - 200	6.0	11.0
200 - 300	2.9	13.9
Average Permeability Millidarcys	- - - - -	130.7
Average Percent Porosity	- - - - -	19.2
Average Percent Oil Saturation	- - - - -	31.6
Average Percent Water Saturation	- - - - -	49.8
Average Oil Content, Bbls./A. Ft.	- - - - -	465.
Total Oil Content, Bbls./Acre	- - - - -	6,464.
Average Percent Oil Recovery by Laboratory Flooding Tests	- - - - -	6.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	- - - - -	101.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	- - - - -	956.
Total Calculated Oil Recovery, Bbls./Acre	- - - - -	See "Calculated Recovery" Section.
Packer Setting, Feet	- - - - -	
Viscosity, Centipoises @	- - - - -	
A. P. I. Gravity, degrees @ 60 °F	- - - - -	
Elevation, Feet	- - - - -	

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Location <u>165' EWL & 495' NSL NW SW</u>		
Section <u>25</u> Twp. <u>17S</u> Rge. <u>21E</u> County <u>Miami</u> State <u>Kansas</u>		
Name of Sand - - - - -	Squirrel	
Top of Core - - - - -	536.0	
Bottom of Core - - - - -	555.0	
Top of Sand - - - - -	536.0	
Bottom of Sand - - - - -	543.8	
Total Feet of Permeable Sand - - - - -	6.1	
Total Feet of Floodable Sand - - - - -	1.0	
Distribution of Permeable Sand:		
Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	3.7	3.7
10 - 20	1.4	5.1
40 - 50	1.0	6.1
Average Permeability Millidarcys - - - - -	11.3	
Average Percent Porosity - - - - -	17.8	
Average Percent Oil Saturation - - - - -	33.7	
Average Percent Water Saturation - - - - -	52.3	
Average Oil Content, Bbls./A. Ft. - - - - -	468.	
Total Oil Content, Bbls./Acre - - - - -	2853.	
Average Percent Oil Recovery by Laboratory Flooding Tests - - - - -	109.	
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - -	109.	
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - -	See "Calculated Recovery" Section.	
Total Calculated Oil Recovery, Bbls./Acre - - - - -		
Packer Setting, Feet - - - - -		
Viscosity, Centipoises @ - - - - -		
A. P. I. Gravity, degrees @ 60 °F - - - - -		
Elevation, Feet - - - - -		

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The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid. 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>
	<u>PERU SAND</u>
378.0 - 379.9	Gray sandy shale.
379.9 - 381.1	Light brown slightly calcareous sandstone.
381.1 - 381.6	Gray limestone.
381.6 - 383.9	Light brown laminated slightly calcareous sandstone.
383.9 - 385.1	Gray limestone.
385.1 - 386.6	Gray and light brown laminated shale and slightly calcareous sandstone.
386.6 - 395.0	Brown slightly calcareous sandstone.
395.0 - 395.5	Light brown calcareous sandstone.

SQUIRREL SAND

536.0 - 538.7	Light brown shaly sandstone.
538.7 - 540.4	Gray sandy shale.
540.4 - 543.8	Light brown shaly sandstone.
543.8 - 555.0	Gray sandy shale.

-3-

LABORATORY FLOODING TESTSPERU SAND

The sand in this core responded to laboratory flooding tests, as a total recovery of 956 barrels of oil per acre was obtained from 9.5 feet of sand. The weighted average percent oil saturation was reduced from 30.9 to 24.9, or represents an average recovery of 6.0 percent. The weighted average effective permeability of the samples is 10.28 millidarcys, while the average initial fluid production pressure is 19.5 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 15 samples tested, 10 produced water and oil, and 3 samples produced water only. This indicates that approximately 67 percent of the sand represented by these samples is floodable sand.

Please note that the coregraph now presents residual oil saturation after flooding tests instead of recovery, as in the past.

SQUIRREL SAND

The sand in this core responded to laboratory flooding tests, as a total recovery of 109 barrels of oil per acre was obtained from 1.0 feet of sand. The weighted average percent oil saturation was reduced from 40.0 to 33.0, or represents an average recovery of 7.0 percent. The weighted average effective permeability of the samples is 0.30 millidarcys, while the average initial fluid production pressure is 35.0 pounds per square inch (See Table V).

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By observing the data given in Table IV, you will note that of the 7 samples tested, 1 produced water and oil, This indicates that approximately 14 percent of the sand represented by these samples is floodable sand.

Please note that the coregraph now presents residual oil saturation after flooding tests instead of recovery, as in the past.

CALCULATED RECOVERY

It would appear from a study of the data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 3,460 barrels of oil per acre from the Peru Sand, and approximately 268 barrels of oil per acre from the Squirrel Sand. This is an average recovery of 364 barrels per acre foot from 9.5 feet of floodable sand from the Peru Sand, and an average recovery of 268 barrels per acre foot from 1.0 feet of floodable sand from the Squirrel Sand.

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

	<u>PERU SAND</u>	<u>SQUIRREL SAND</u>
Original formation volume factor, estimated	1.03	1.04
Reservoir water saturation, percent, estimated	30.0	30.0
Average porosity, percent	21.8	20.1
Oil saturation after flooding, percent	24.9	33.0
Performance factor, percent, estimated	50.0	50.0
Net floodable sand, feet	9.5	1.0

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE I-B

Company Rantoul Energy Corporation Lease Carter Well No. 17

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.		
<u>PERU SAND</u>											
1	380.2	17.8	19	74	93	262	13.	0.6	0.6	157	7.80
2	381.0	19.8	38	53	91	584	46.	0.6	1.2	350	27.60
3	382.3	16.4	23	68	91	293	113.	1.0	2.2	293	113.00
4	383.5	9.1	39	54	93	275	63.	1.3	3.5	358	81.90
5	385.5	22.9	32	31	63	569	60.	1.0	4.5	569	60.00
6	386.5	24.1	33	33	66	617	263.	0.5	5.0	309	131.50
7	387.5	23.5	32	36	68	583	226.	1.4	6.4	816	316.40
8	388.5	20.1	31	46	77	483	127.	1.0	7.4	483	127.00
9	389.5	14.4	37	44	81	413	133.	1.0	8.4	413	133.00
10	390.5	27.2	27	40	67	570	266.	1.0	9.4	570	266.00
11	391.5	18.5	46	46	92	660	87.	1.0	10.4	660	87.00
12	392.5	27.2	24	47	71	506	157.	1.0	11.4	506	157.00
13	393.5	16.0	20	72	92	248	113.	1.0	12.4	248	113.00
14	394.5	21.3	36	60	96	595	149.	1.0	13.4	595	149.00
15	395.4	10.1	35	49	84	274	93.	0.5	13.9	137	46.50
<u>SQUIRREL SAND</u>											
1	536.5	18.6	30	54	84	433	4.7	1.0	1.0	433	4.70
2	537.5	16.3	39	55	94	493	1.5	1.0	2.0	493	1.50
3	538.5	16.9	27	65	92	354	0.53	0.7	2.7	248	0.37
4	540.5	19.3	42	33	75	629	15.6	0.6	3.3	377	9.00
5	541.5	15.9	25	68	93	308	3.6	1.0	4.3	308	3.60
6	542.5	18.0	34	52	86	475	11.	0.8	5.1	380	8.80
7	543.5	19.8	40	35	75	614	41.	1.0	6.1	614	41.00

SUMMARY OF PERMEABILITY & SATURATION TESTS

Company Rantoul Energy Corporation **Lease** Carter **Well No.** 17

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
		<u>PERU SAND</u>	
379.9 - 395.5	13.9	130.7	1816.70
		<u>SQUIRREL SAND</u>	
536.0 - 543.8	6.1	11.3	68.97

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 Bbbl./Acre
			<u>PERU SAND</u>			
379.9 - 395.5	13.9	19.2	31.6	49.8	465	6,464
			<u>SQUIRREL SAND</u>			
536.0 - 543.8	6.1	17.8	33.7	52.3	468	2,853

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Rantoul Energy Corporation Lease Carter Well No. 17

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.			
						<u>PERU SAND</u>						
1	380.2	18.0	19	265	0	0	19	79	14	0.15	30	
2	381.0	20.3	38	598	14	220	24	54	44	0.75	30	
3	382.3	16.5	23	294	2	26	21	70	52	1.05	30	
4	383.5	9.3	39	281	0	0	39	55	0	Imp.	-	
5	385.5	22.6	32	561	5	88	27	64	234	9.33	20	
6	386.5	23.9	33	612	8	148	25	64	304	10.33	20	
7	387.5	23.9	33	612	7	130	26	63	304	15.60	10	
8	388.5	20.6	31	495	6	96	25	67	238	7.95	25	
9	389.5	14.4	37	413	7	78	30	65	262	4.35	20	
10	390.5	27.0	27	566	5	105	22	69	270	17.14	15	
11	391.5	18.4	46	657	0	0	46	45	0	Imp.	-	
12	392.5	26.8	24	499	2	42	22	67	284	24.89	10	
13	393.5	16.5	20	256	0	0	20	72	226	11.36	15	
14	394.5	21.5	36	600	8	133	26	66	406	5.55	15	
15	395.4	16.4	20	254	0	0	20	77	32	0.60	30	
						<u>SQUIRREL SAND</u>						
1	536.5	18.6	30	433	0	0	30	60	0	Imp.	-	
2	537.5	16.5	38	486	0	0	38	56	0	Imp.	-	
3	538.5	16.6	28	361	0	0	28	64	0	Imp.	-	
4	540.5	19.0	43	634	0	0	43	40	0	Imp.	-	
5	541.5	16.2	23	289	0	0	23	70	0	Imp.	-	
6	542.5	18.0	34	475	0	0	34	54	0	Imp.	-	
7	543.5	20.1	40	624	7	109	33	54	7	0.30	35	

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

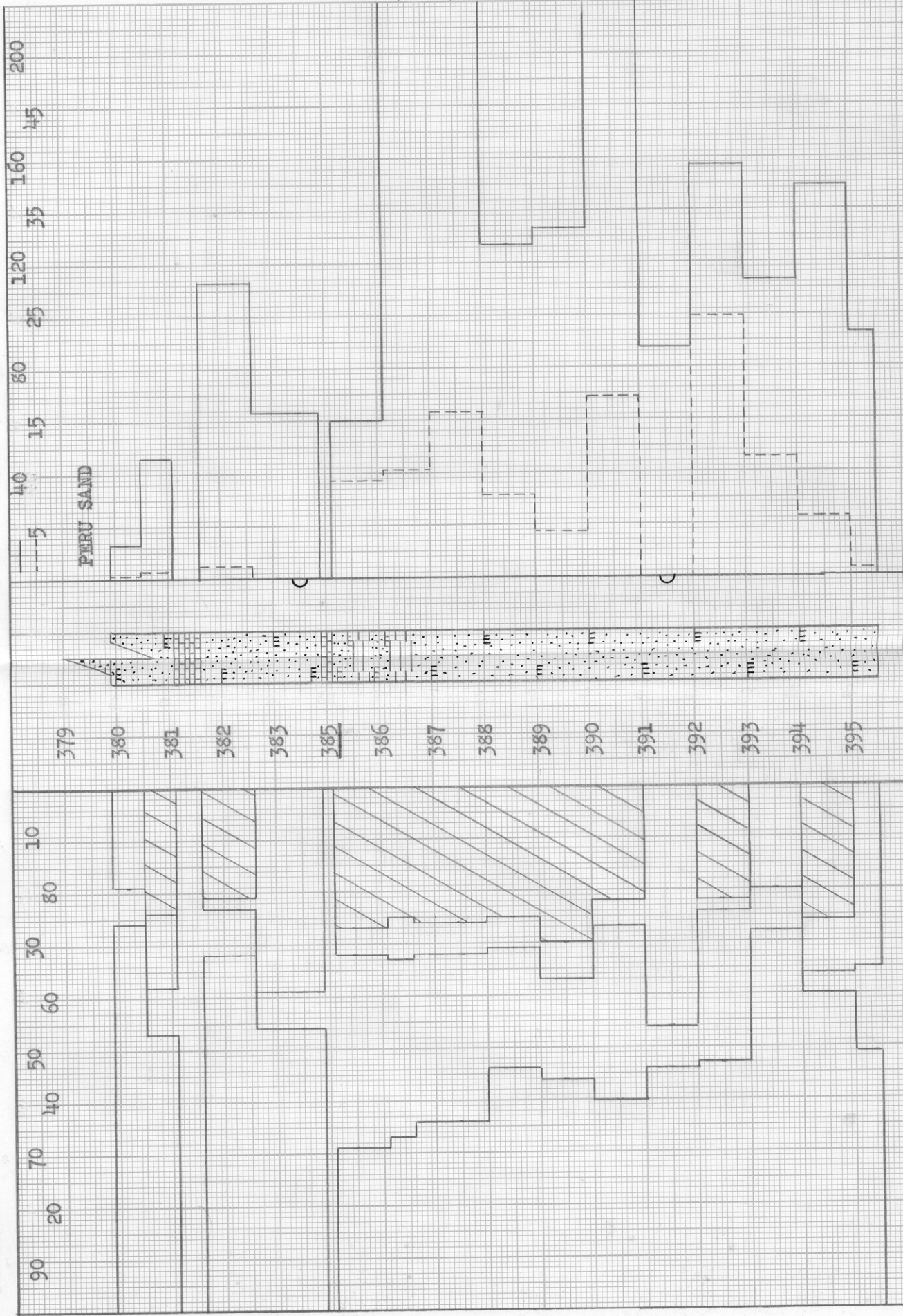
Company	Rantoul Energy Corporation	Lease	Carter	Well No.	17
		PERU SAND	SQUIRREL SAND		
Depth Interval, Feet	379.9 - 395.5	536.0 - 543.8			
Feet of Core Analyzed	9.5	1.0			
Average Percent Porosity	21.8	20.1			
Average Percent Original Oil Saturation	30.9	40.0			
Average Percent Oil Recovery	6.0	7.0			
Average Percent Residual Oil Saturation	24.9	33.0			
Average Percent Residual Water Saturation	65.3	54.0			
Average Percent Total Residual Fluid Saturation	90.2	87.0			
Average Original Oil Content, Bbls./A. Ft.	521.	624.			
Average Oil Recovery, Bbls./A. Ft.	101.	109.			
Average Residual Oil Content, Bbls./A. Ft.	420.	515.			
Total Original Oil Content, Bbls./Acre	4,950.	624.			
Total Oil Recovery, Bbls./Acre	956.	109.			
Total Residual Oil Content, Bbls./Acre	3,994.	515.			
Average Effective Permeability, Millidarcys	10.28	0.30			
Average Initial Fluid Production Pressure, p.s.i.	19.5	35.0			

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

WATER SAT., PERCENT $\longrightarrow$ OIL SAT., PERCENT $\longleftarrow$

PERMEABILITY, IN MILLIDARCY

EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCY



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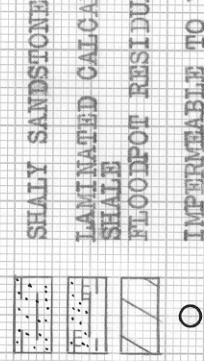
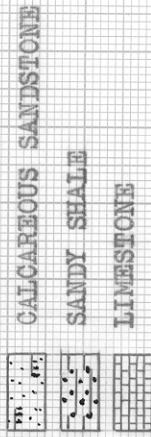
226

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SQUIRREL SAND

536
537
538
540
541
542
543

KEY:



RANTOUL ENERGY CORP.

CARTER LEASE

WELL NO. 17

MIAMI COUNTY, KANSAS

DEPTH INTERVAL, FEET
379.9 - 395.5
536.0 - 543.8

FEET OF CORE ANALYZED
13.9
6.1

AVERAGE PERCENT POROSITY
19.2
17.8

AVG. OIL SATURATION PERCENT
31.6
33.7

AVG. WATER SATURATION PERCENT
49.8
52.3

AVERAGE PERMEABILITY, MILLIDARCS
130.7
11.3

CALCULATED OIL RECOVERY BBLs./ACRE
3,460 (PRIMARY & WATERFLOODING)
268 (PRIMARY & WATERFLOODING)

PERU SAND

379.9 - 395.5

13.9

19.2

31.6

49.8

130.7

3,460 (PRIMARY & WATERFLOODING)

SQUIRREL SAND

536.0 - 543.8

6.1

17.8

33.7

52.3

11.3

268 (PRIMARY & WATERFLOODING)

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JANUARY, 1980
HR