

NORTHWEST PIPELINE CORPORATION

DEC 6 1988

PRODUCTION AND DRILLING

DESORPTION DATA FOR COALBED METHANE GAS

FOR

NORTHWEST PIPELINE CORPORATION

ROSA No.203

Raven Ridge Resources

INCORPORATED

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by

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NOVEMBER 29, 1988

ROSA No.203
DESORPTION DATA

INTRODUCTION

Cuttings were collected from eight Fruitland Formation coal intervals on October 16, 1988. The cuttings were collected as they traveled out the end of the borehole and placed in gas-tight cannisters. The volume of methane gas desorbed from the cuttings was measured as it was bled from cannisters into a modified graduated cylinder. The volume of gas collected was corrected for gas lost during transport of the cuttings up-hole to the surface. The corrected gas volume was then divided by the weight of the coal sample and the result was corrected to an estimate of standard cubic feet of methane per ton of coal.

Two methods of correcting for gas volume lost during up-hole transport of the cuttings were used: a conventional method developed by Smith and Williams (1981), and one developed by R. C. Pilcher (Raven Ridge Resources). The second method differs from the first in that desorption rate calculations are made for the gas as the cuttings move up-hole and does not assume that this rate is the same at all depths. There are significant differences in the volumetric results from these two methods when the coal travels up-hole from great depths and takes an exceptionally long time to reach the surface, and when very heavy drilling fluids are used in the hole. Since the Raven Ridge Resources' method is not time-dependent, but dependent on measurable physical parameters that vary from hole to hole; it is our preferred method for calculation of potentially recoverable methane from coal.

NORTHWEST PIPELINE CORPORATION- ROSA No.203

DESORPTION DATA SUMMARY SHEET

DEPTH	CANNISTER	AMOUNT GAS DESORBED (ml)	SAMPLE WEIGHT (g)	VOL. CORR. FACTOR	GAS CONTENT OF COAL (SCF/T) (Smith & Williams)	VOL. CORR. FACTOR	GAS CONTENT OF COAL (SCF/T) (Pilcher)
3177-3181	RR1	9,460	824	1.335	379.2	1.36	385.2
3190-3194	RR2	4,210	679	1.232	188.7	1.95	298.9
3214-3222	RR3	7,105	1,140	1.332	206.2	1.76	273.0
3242-3245	RR4	455	597	1.328	25.2	2.02	38.4
3257-3259	RR6	2,625	610	1.328	144.2	2.31	250.8
3270-3275	RR8	3,915	851	1.264	147.7	1.38	161.4
3276-3280	RR11	4,925	918	1.279	174.2	1.34	182.7
3282-3288	RR12	7,020	1,012	1.267	223.6	1.25	220.0

CANNISTER RR1
 NORTHWEST PIPELINE CORP. ROBA #203
 SE/SE SECTION 13 T81N R9W
 RIO ARriba COUNTY, NEW MEXICO
 INTERVAL DEPTH(S):77-81(S)

TIME COAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	SAMPLE WT.	324 g
16-Oct-88 13 :17	16.00 MIN	0.15	TOTAL GAS	9,460 ml
TIME COAL ARRIVED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT OF COAL:	
16-Oct-88 13 :43	19.00 MIN	0.43	Surf. cond.:	STP cond.:
TIME CANNISTER SEALED	T25%:	VOLUME CORRECTION	490.8 CF/T	379.2 SCF/T
16-Oct-88 13 :46	24.96 MIN	1.335	15.33 ml/g	11.34 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	VSTP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	13 :51	0.08	0	695	26.0	24.00	0.80	695	537.0	7.3%
16-Oct-88	13 :53	0.12	0	940	26.0	24.00	0.80	940	726.3	17.3%
16-Oct-88	13 :55	0.15	0	745	26.0	24.00	0.80	745	575.6	25.2%
16-Oct-88	14 :12	0.43	0	810	27.0	24.00	0.80	810	623.7	33.7%
16-Oct-88	14 :14	0.47	0	875	27.0	24.00	0.80	875	673.8	43.0%
16-Oct-88	14 :15	0.48	0	185	27.0	24.00	0.80	185	142.5	44.9%
16-Oct-88	14 :26	0.67	0	710	27.0	24.00	0.80	710	546.7	52.4%
16-Oct-88	14 :49	1.05	0	825	31.0	24.00	0.80	825	626.9	61.2%
16-Oct-88	14 :51	1.08	0	165	31.0	24.00	0.80	165	125.4	62.9%
16-Oct-88	15 :25	1.65	0	765	27.0	24.00	0.80	765	589.1	71.0%
16-Oct-88	15 :27	1.68	0	220	27.0	24.00	0.80	220	169.4	73.3%
16-Oct-88	15 :38	1.87	0	300	26.0	24.00	0.80	300	231.8	76.5%
16-Oct-88	15 :48	2.03	0	215	26.0	24.00	0.80	215	166.1	78.8%
16-Oct-88	16 :27	2.68	0	500	26.0	24.00	0.80	500	386.3	84.0%
16-Oct-88	17 : 5	3.32	0	390	25.0	23.90	0.80	390	301.1	88.2%
16-Oct-88	17 :39	3.88	0	275	25.0	23.90	0.80	275	212.3	91.1%
16-Oct-88	18 :34	4.80	0	210	20.0	23.90	0.80	210	164.9	93.3%
16-Oct-88	18 :58	5.20	0	75	18.0	23.90	0.80	75	59.3	94.1%
16-Oct-88	21 : 8	7.37	0	45	24.0	24.70	0.83	45	36.0	94.6%
17-Oct-88	9 :14	19.47	0	165	22.0	24.70	0.83	165	133.0	96.3%
18-Oct-88	8 :32	42.77	0	75	21.0	24.80	0.83	75	60.9	97.1%
19-Oct-88	9 : 5	67.32	0	190	21.0	24.60	0.82	190	153.0	99.1%
19-Oct-88	16 :20	74.57	0	85	25.0	24.60	0.82	85	67.5	100.0%
20-Oct-88	9 :20	91.57	0	0	20.0	24.50	0.82	0	0.0	100.0%

TOTAL CH4 DESORBED: 9,460 7,309

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

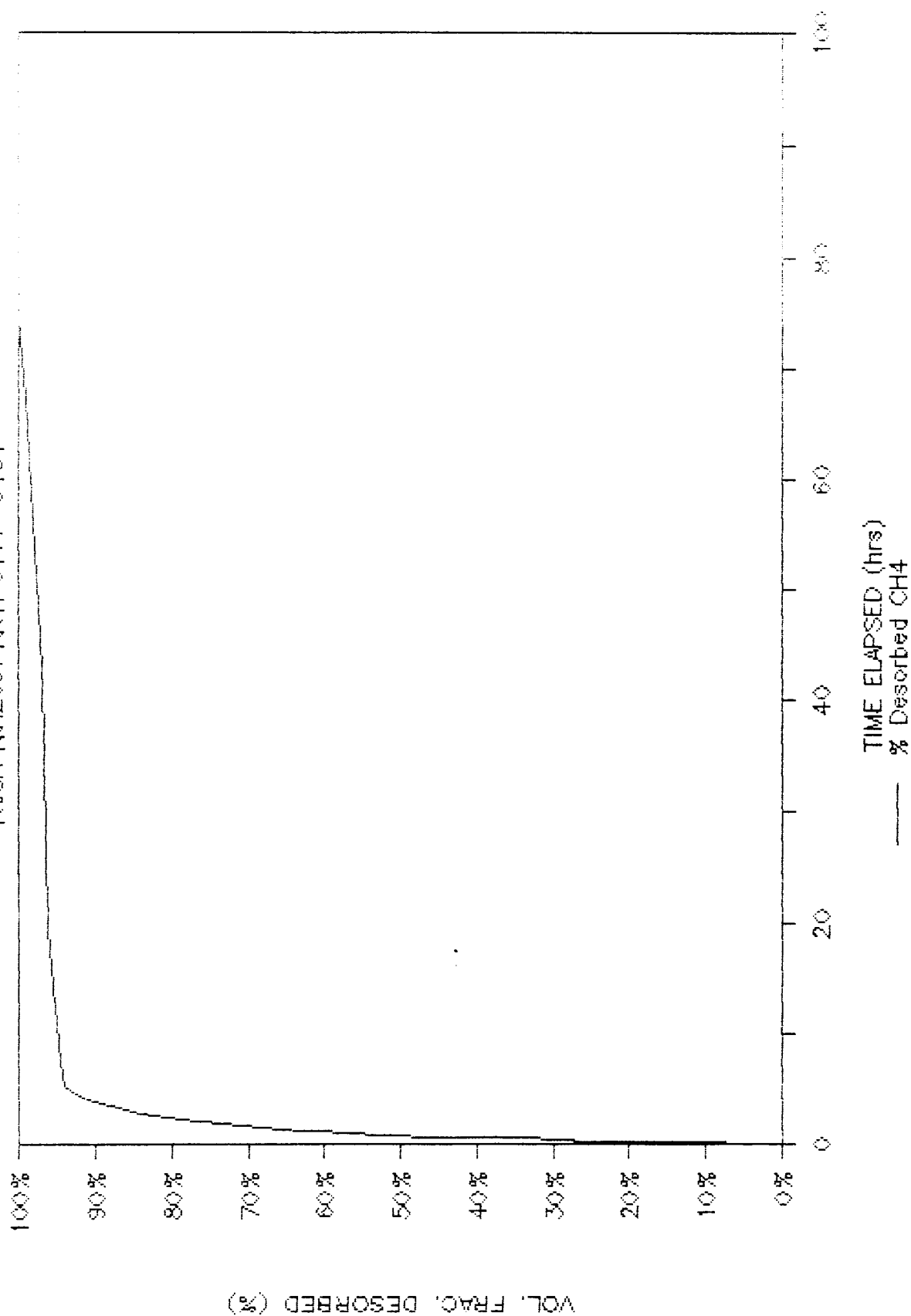
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

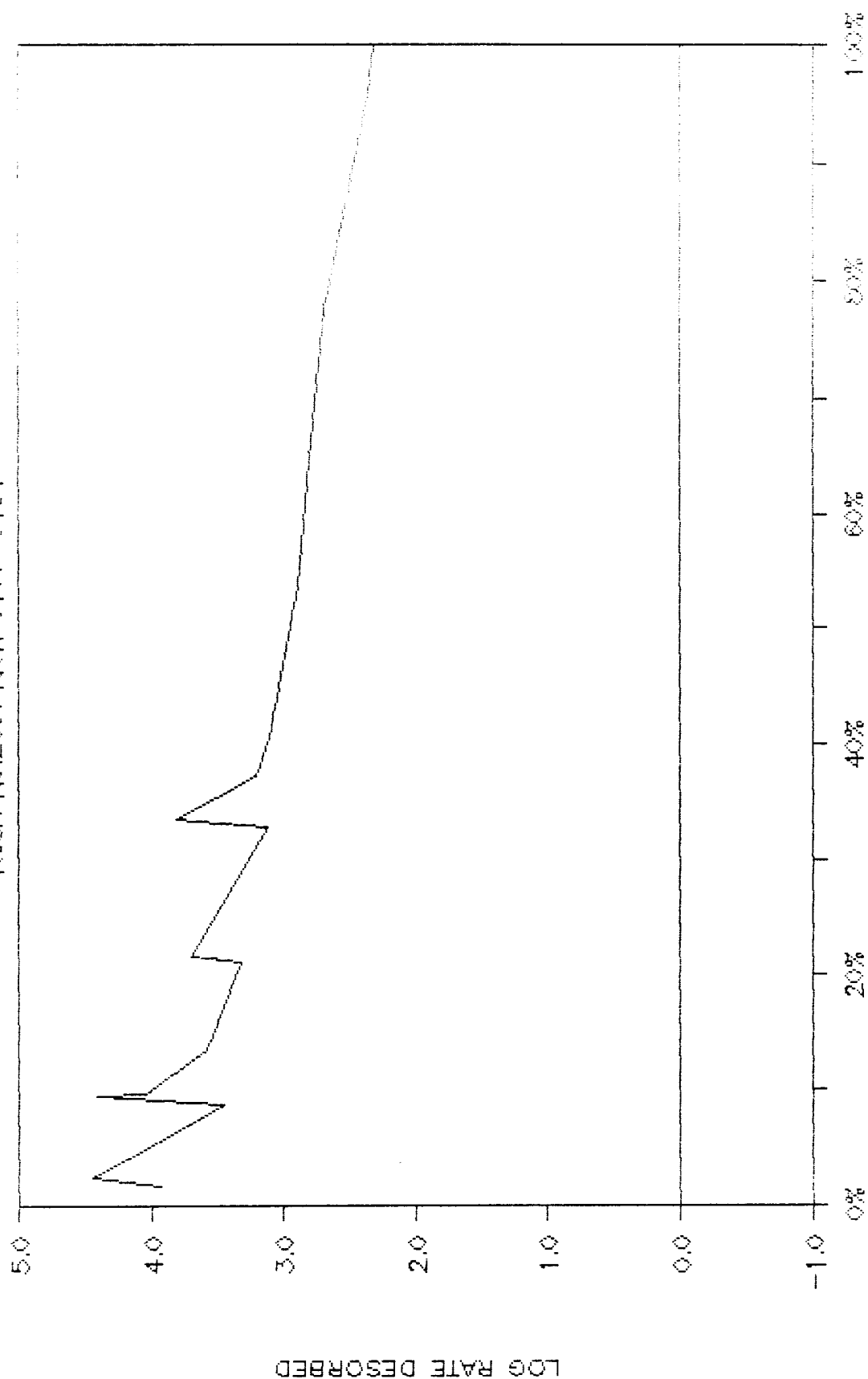
ROGA No.203; RR1, 3177-3181



DESORP. RATE	LOG RATE	CUM. % 5 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (atm)	V G AMS. PRESSURE	T AMS. (K)	V G STP (ml)
3840.0	3.92	1.7%	DEPTH	3177	0	1.60	173.13	301.00	183.0
36200.0	4.45	2.3%	LAG TIME	13	1	155	3.57	301.73	183.6
32350.0	4.85	3.0%	MUD WT	8.3	2	397	12.34	302.96	182.1
2553.3	3.46	3.7%	BHP	93.23	3	596	18.10	303.74	181.7
24550.0	4.42	9.3%	P. GRAD/MIN	5.77	4	754	23.97	304.92	181.3
11100.0	4.05	9.7%	DESORP RATE	129.00	5	993	29.34	305.90	180.9
3372.7	3.59	13.6%	SURFACE T	301.0	6	1191	35.41	306.88	180.4
2152.2	3.33	21.3%	BHT K	316.68	7	1390	41.17	307.86	180.0
4950.0	3.69	21.7%	Uq	417	8	1589	46.94	308.84	179.6
1350.0	3.13	33.0%	BHT F	110	9	1787	52.71	309.82	179.2
3300.0	3.32	33.7%			10	1986	58.48	310.80	178.8
1636.4	3.21	37.3%			11	2184	64.24	311.78	178.4
1290.0	3.11	40.7%			12	2383	70.01	312.76	178.0
769.2	2.89	53.7%			13	2581	75.78	313.74	177.6
615.8	2.79	66.3%			14	2780	81.55	314.72	177.2
485.3	2.69	77.7%			15	2978	87.31	315.70	176.8
229.1	2.36	96.0%			16	3177	93.08	316.68	176.4
187.5	2.27	104.0%							
VOL DESORBED DURING BOTTOMS UP							250.0		2204.1
VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED							519.9		399.0
VOL CORRECTION FACTOR							1.05		1.36
TOTAL AMOUNT OF GAS DESORBED							387.0 CF/T 12.1 ml/g		385.2 SCF 12.0 ml/

LOG DESORP. RATE VS. CUM. % RATE

ROGA No.203: RR1, 3177-3181



CANNISTER R&R
 NORTHWEST PIPELINE CORP. ROSA #203
 BEAVER SECTION 13 T&N R&R
 RIO ARriba COUNTY, NEW MEXICO
 INTERVAL DEPTH: 90-9194

TIME COAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	SAMP.WT.	679 g
16-Oct-88 13 :46	13.00 MIN	0.16	TOTAL GAS	4,210 ml
TIME COAL ARRIVED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT OF COAL:	
16-Oct-88 14 : 4	19.00 MIN	0.45	Surf. cond.:	STP cond.:
TIME CANNISTER SEALED	T25%:	VOLUME CORRECTION:	244.6 CF/T	188.7 SCF/T
16-Oct-88 14 : 7	23.63 MIN	1.232	7.64 ml/g	5.39 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	V@STP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	14 :11	0.07	0	660	27.0	24.00	0.80	660	508.2	15.7%
16-Oct-88	14 :16	0.15	0	540	27.0	24.00	0.80	540	415.8	28.5%
16-Oct-88	14 :23	0.35	0	620	27.0	24.00	0.80	620	477.4	43.2%
16-Oct-88	14 :52	0.75	0	720	31.0	24.00	0.80	720	547.1	60.3%
16-Oct-88	15 :24	1.28	0	530	27.0	24.00	0.80	530	408.1	72.9%
16-Oct-88	16 :25	2.30	0	520	26.0	24.00	0.80	520	401.8	85.3%
16-Oct-88	17 : 4	2.95	0	205	25.0	23.90	0.80	205	158.3	90.1%
16-Oct-88	18 :37	4.50	0	140	20.0	23.90	0.80	140	109.9	93.5%
16-Oct-88	21 : 7	7.00	0	15	24.0	24.70	0.83	15	12.0	93.8%
17-Oct-88	9 :13	19.10	0	75	22.0	24.70	0.83	75	60.4	95.6%
18-Oct-88	8 :31	42.40	0	80	21.0	24.80	0.83	80	65.0	97.5%
19-Oct-88	9 : 6	66.98	0	40	21.0	24.60	0.82	40	32.2	98.5%
19-Oct-88	16 :21	74.23	0	65	25.0	24.60	0.82	65	51.6	100.0%
20-Oct-88	9 :22	91.25	0	0	20.0	24.50	0.82	0	0.0	100.0%

TOTAL CH4 DESORBED: 4,210 3,248

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

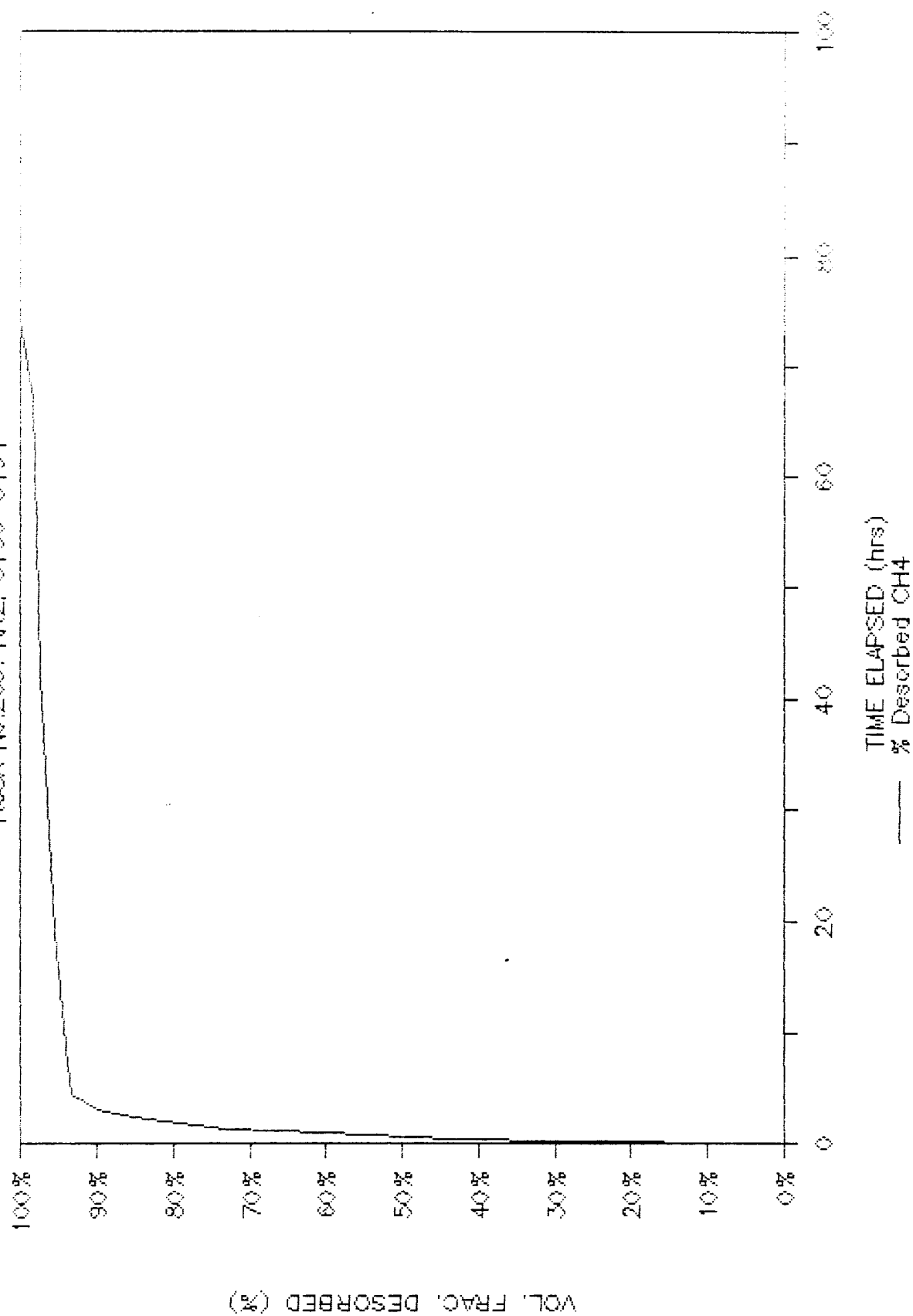
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

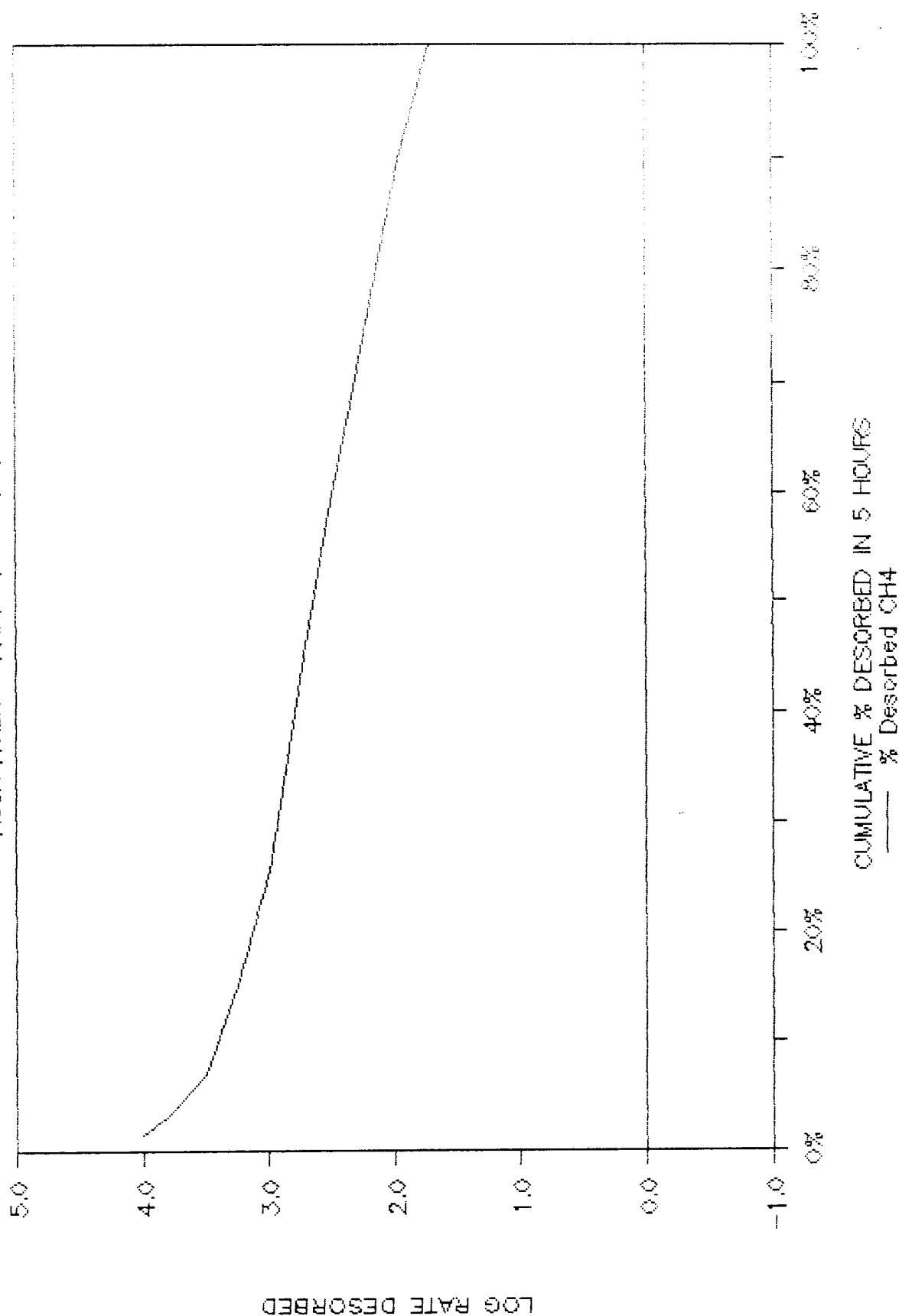
ROGA No.203; RR2, 3190-3194



DESORP. RATE	LOG RATE	CUM. % 5 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (psia)	V G AMB. PRESSURE	T AMB. (°C)	VGSTP (ml)
2930.0	4.00	1.5%	DEPTH	3190	0	0.30	295.7	301.00	157.7
1480.0	3.81	3.0%	LAG TIME	16	1	179	3.59	301.98	157.4
3100.0	3.49	7.0%	MUD WT	8.3	2	399	12.38	302.96	156.9
1900.0	3.26	15.0%	BHP	93.66	3	593	15.18	303.94	156.3
773.7	3.00	25.7%	P. GRAD/MIN	5.77	4	793	23.97	304.92	155.8
511.5	2.71	46.0%	DESORP RATE	165.00	5	997	29.76	305.90	155.3
315.4	2.50	59.0%	SURFACE T	301.0	6	1196	35.55	306.88	154.8
20.3	1.96	90.0%	BHT K	316.68	7	1396	41.34	307.86	154.4
6.0	0.78	140.0%	Uq	495	8	1595	47.13	308.84	153.9
			BHT F	110	9	1794	52.92	309.82	153.4
					10	1994	58.71	310.80	152.9
					11	2193	64.51	311.78	152.4
					12	2393	70.30	312.76	151.9
					13	2592	76.09	313.74	151.5
					14	2791	81.88	314.72	151.0
					15	2991	87.67	315.70	150.5
					16	3190	93.46	316.68	150.1
VOL DESORBED DURING BOTTOMS UP							296.4		2616.4
VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED							617.1		473.6
VOL CORRECTION FACTOR							1.14		1.95
TOTAL AMOUNT OF GAS DESORBED							226.5 CF/T 7.1 ml/g		298.9 SCF 9.3 ml/

LOG DESORP. RATE VS. CUM. % RATE

ROSA No.203: PR2, 3190-3194



CANNISTER R93
 NORTHWEST PIPELINE CORP. ROSA #203
 SEABE SECTION 18 TOWN REN
 RIO ARriba COUNTY, NEW MEXICO
 INTERVAL DEPTH: 3214-3222

TIME COAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	SAMP.WT.	1140 g
16-Oct-88 15 : 0	15.00 MIN	0.12	TOTAL GAS	7,105 ml
TIME COAL ARRIVED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT OF COAL:	
16-Oct-88 15 :18	17.00 MIN	0.44	Surf. cond.:	373 cond.:
TIME CANNISTER SEALED	T25%:	VOLUME CORRECTION	245.8 CF/T	306.2 SCF/T
16-Oct-88 15 :17	21.95 MIN	1.932	3.00 ml/g	5.44 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	VGSTP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	15 :20	0.05	0	750	27.0	24.00	0.80	750	577.5	10.6%
16-Oct-88	15 :22	0.08	0	760	27.0	24.00	0.80	760	585.2	21.3%
16-Oct-88	15 :28	0.18	0	820	27.0	24.00	0.80	820	631.4	32.8%
16-Oct-88	15 :36	0.32	0	690	26.0	24.00	0.80	690	533.1	42.5%
16-Oct-88	15 :46	0.48	0	730	26.0	24.00	0.80	730	564.0	52.8%
16-Oct-88	16 :23	1.10	0	710	26.0	24.00	0.80	710	548.6	62.8%
16-Oct-88	16 :24	1.12	0	480	26.0	24.00	0.80	480	370.9	69.5%
16-Oct-88	17 : 2	1.75	0	770	25.0	23.90	0.80	770	594.4	80.4%
16-Oct-88	17 :37	2.33	0	505	25.0	23.90	0.80	505	389.9	87.5%
16-Oct-88	21 : 6	5.82	0	260	24.0	24.70	0.83	260	208.1	91.1%
17-Oct-88	9 :12	17.92	0	225	22.0	24.70	0.83	225	181.3	94.3%
18-Oct-88	8 :29	41.20	0	190	21.0	24.80	0.83	190	154.3	97.0%
19-Oct-88	9 : 7	65.83	0	95	21.0	24.60	0.82	95	76.5	98.3%
19-Oct-88	16 :23	73.10	0	120	25.0	24.60	0.82	120	95.4	100.0%
20-Oct-88	9 :23	90.10	0	0	20.0	24.50	0.82	0	0.0	100.0%

TOTAL CH4 DESORBED: 7,105 5,511

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

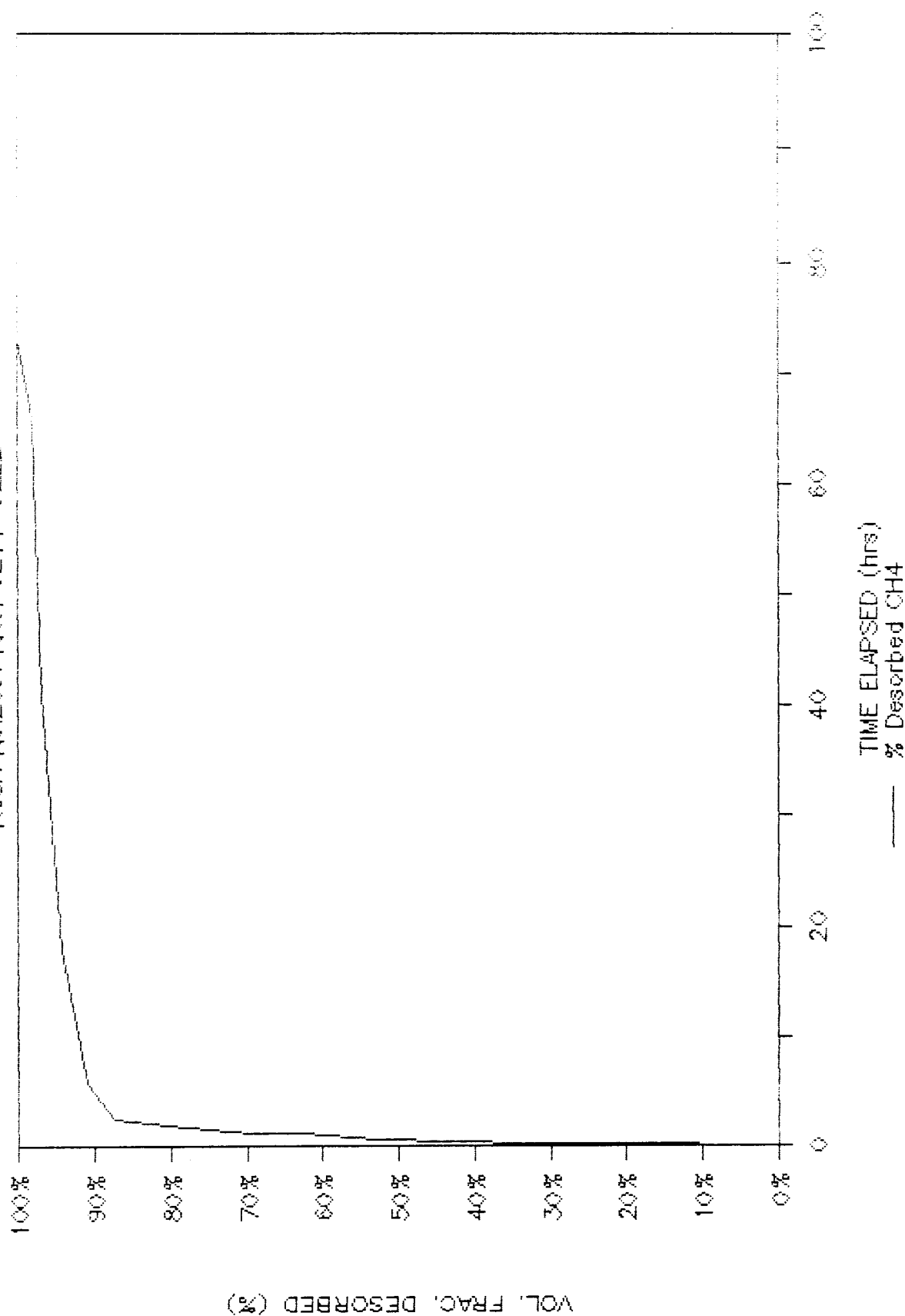
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

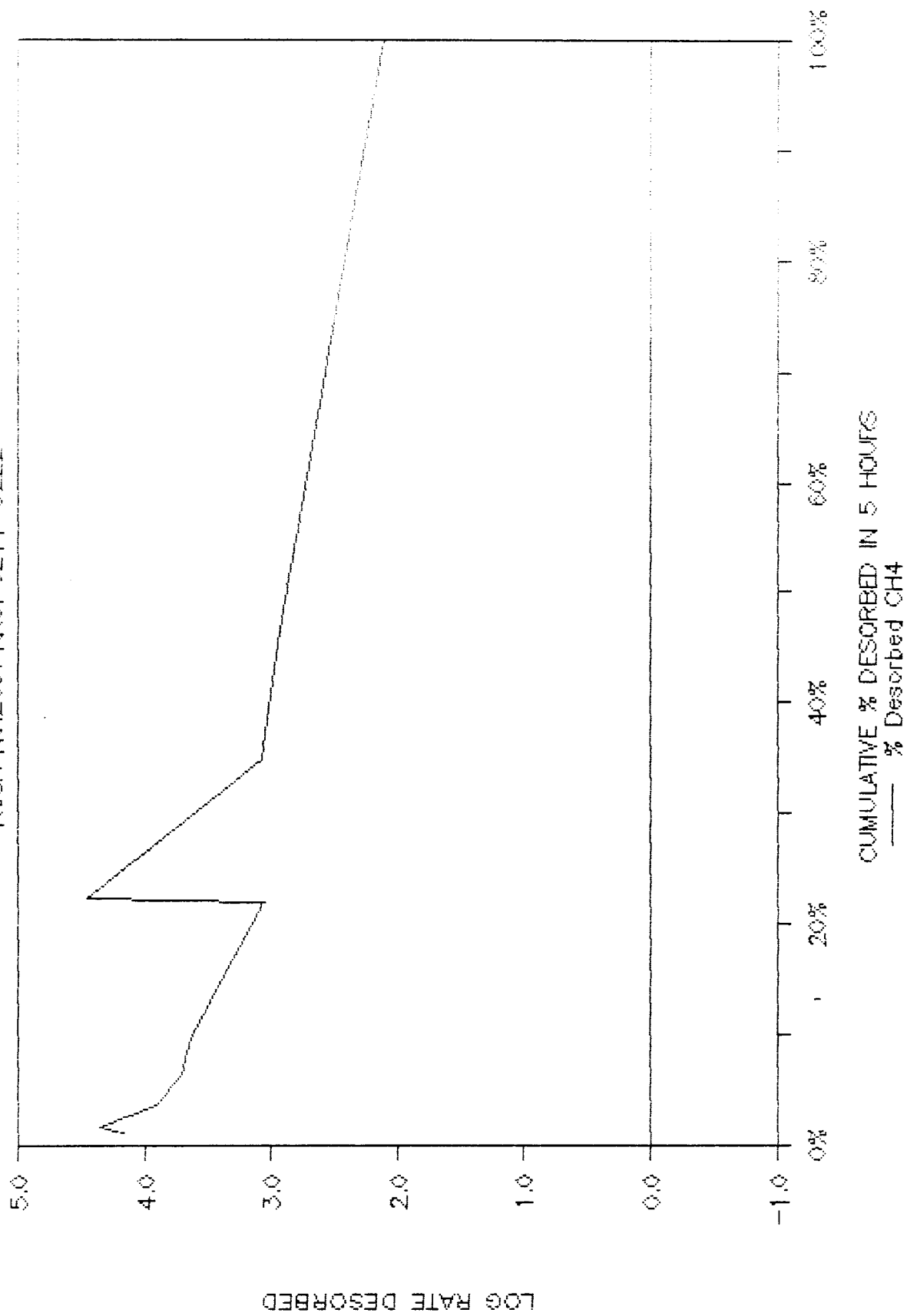
RCSA No.203; FR3, 3214-3222



DESORP. RATE	LOG RATE	CUM. % 5 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (atm)	P G AMB. PRESSURE	T AMB. (K)	VOLSTP ml
15100.0	4.18	1.0%	DEPTH	3214	0	0.80	311.7	311.00	239.2
12300.0	4.36	1.7%	LAG TIME	15	1	214	7.03	302.05	238.4
9200.0	6.91	3.7%	MUD WT	8.3	2	429	13.25	303.09	237.6
5175.0	6.71	6.3%	BHP	94.86	3	643	19.48	304.14	236.7
4830.0	6.64	9.7%	P. GRAD/MIN	6.22	4	957	25.70	305.19	235.9
1151.4	8.06	22.0%	DESORP RATE	259.00	5	1371	31.92	306.23	235.1
23300.0	4.46	22.6%	SURFACE T	301.0	6	1286	33.15	307.27	234.3
1215.8	8.09	35.0%	BHT K	313.68	7	1500	44.37	308.32	233.5
665.7	2.94	46.7%	Uq	500	8	1714	50.60	309.36	232.7
74.6	1.37	116.3%	BHT F	110	9	1928	56.82	310.41	232.0
					10	2143	63.05	311.45	231.2
					11	2357	69.27	312.50	230.4
					12	2571	75.49	313.54	229.6
					13	2785	81.72	314.59	228.9
					14	3000	87.94	315.63	228.1
					15	3214	94.17	316.68	227.4
VOL DESORBED DURING BOTTOMS UP							437.5		3731.0
VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED							623.3		478.4
VOL CORRECTION FACTOR							1.12		1.76
TOTAL AMOUNT OF GAS DESORBED							224.1 CF/T 7.0 ml/g		273.0 SCF 8.5 ml/g

LOG DESORP. RATE VS. CUM. % RATE

RCSA No.203: FR3, 3214-3222



CHAMBER 834
 NORTHWEST PIPELINE CORP. POB# 4203
 SE. 32 SECTION 16 T81N R5W
 RICE COUNTY, NEW MEXICO
 INTERVAL DEPTH: 3242-3245

TIME SEAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	SAMP.WT.	557 g
16-Oct-88 16:135	21.00 MIN	0.39	TOTAL G-3	455 ml
TIME SEAL HARDENED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT OF COAL:	
16-Oct-88 16:146	23.00 MIN	0.45	Surf. cond.:	STP cond.:
TIME CHAMBER SEALED:	T25%:	VOLUME CORRECTION	32.4 CF/T	25.3 SCF/T
16-Oct-88 16:148	23.04 MIN	1.328	1.01 ml/g	0.79 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	V95TP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	17 : 1	0.22	0	210	25.0	23.90	0.80	210	162.1	46.2%
16-Oct-88	17 :37	0.82	0	155	25.0	23.90	0.80	155	119.7	80.2%
16-Oct-88	21 : 5	4.28	0	20	24.0	24.70	0.83	20	16.0	84.6%
17-Oct-88	9 :11	16.38	0	70	22.0	24.70	0.83	70	56.4	100.0%
18-Oct-88	8 :28	39.67	0	0	21.0	24.80	0.83	0	0.0	100.0%

TOTAL CH4 DESORBED: 455 354

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

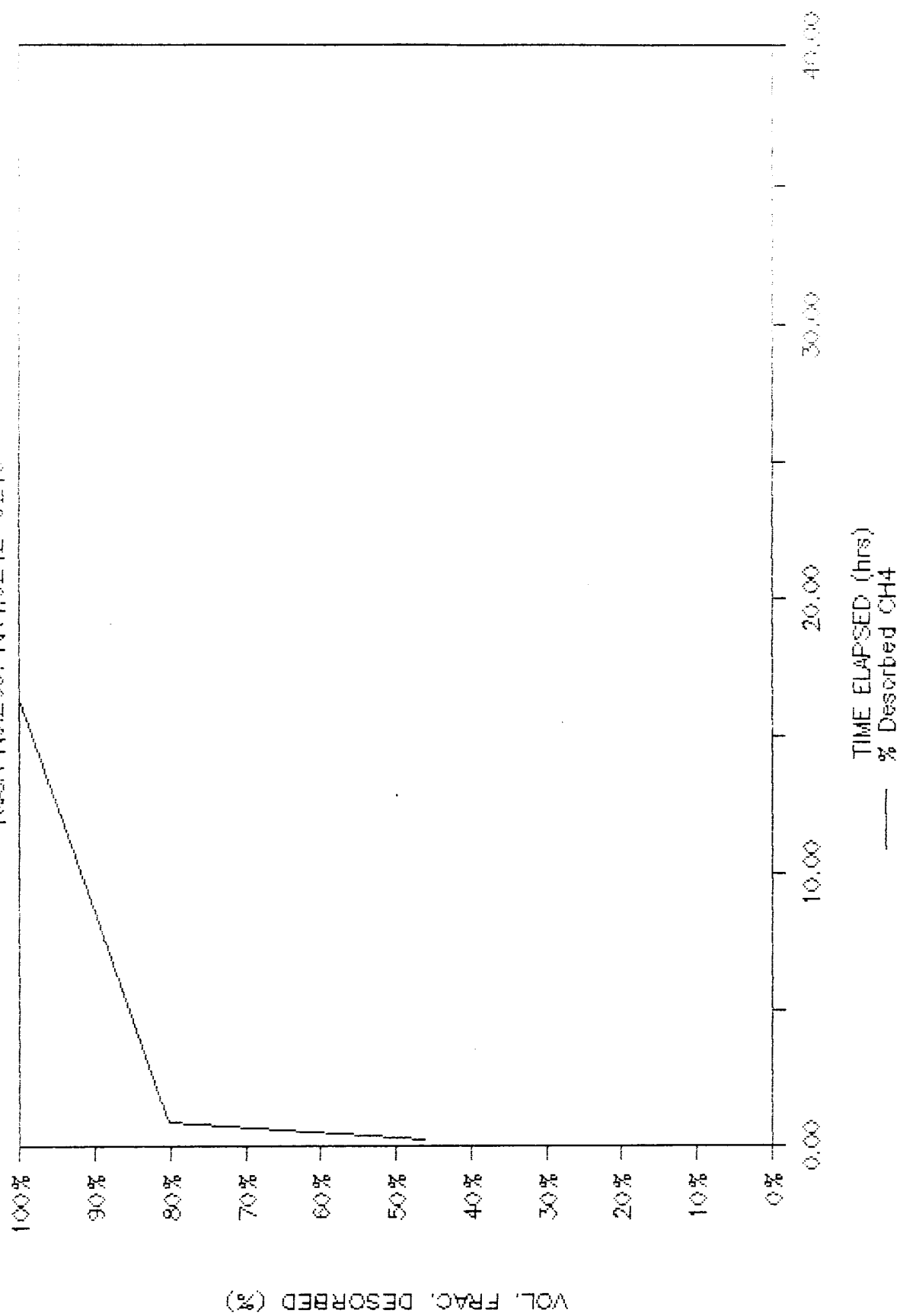
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

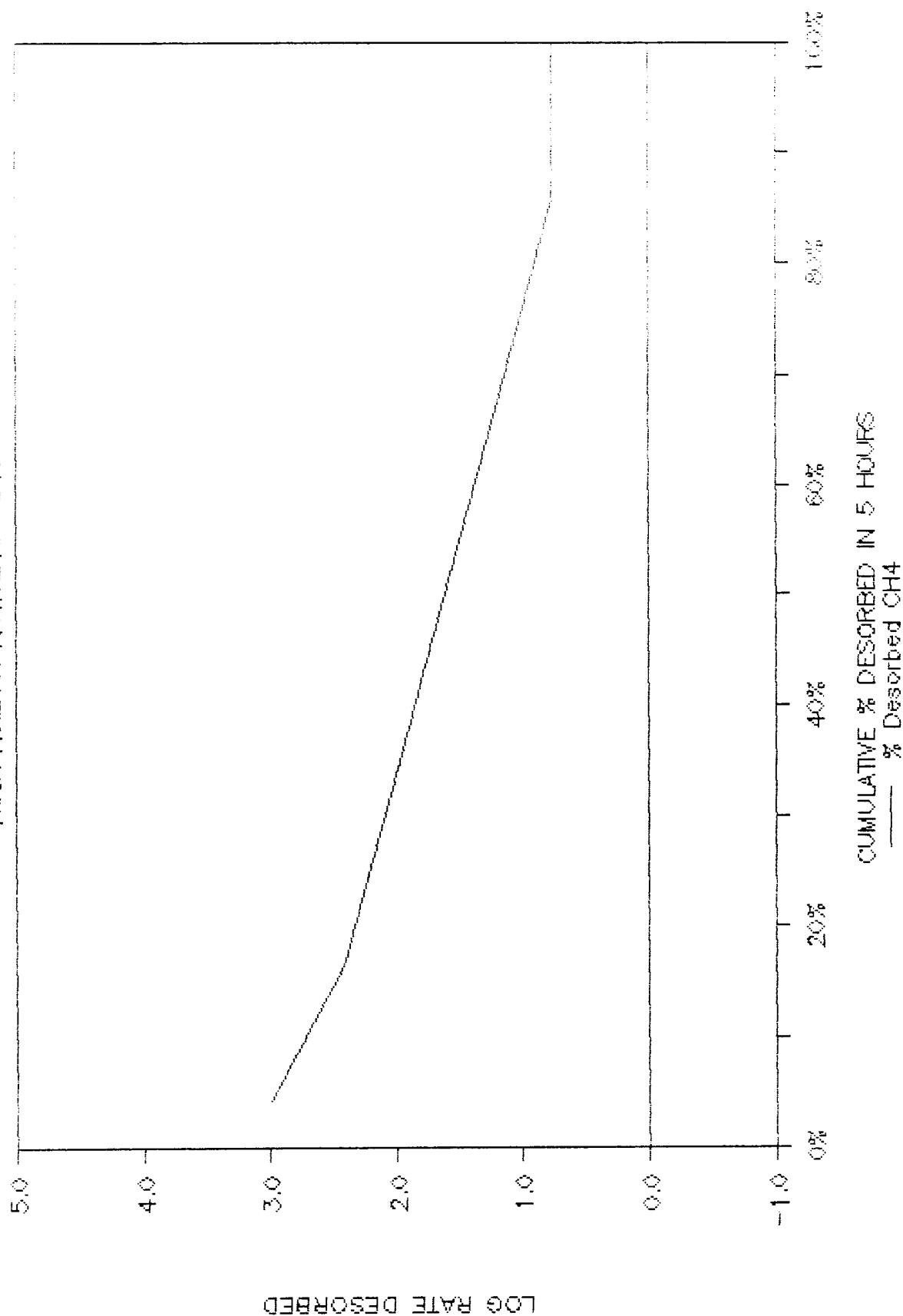
RCSA No.203; FR4,3242-3245



DESORP. RATE	LOG RATE	CUM. % 5 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (KSC)	V G AMB. PRESSURE	T AMB. (K)	Q987P (ml)
169.2	2.69	4.3%	DEPTH	3242	0	0.30	10.2	301.00	15.3
158.3	2.41	16.6%	LOG TIME	21	1	154	5.28	301.75	15.4
5.6	0.76	35.7%	MUD WT	8.3	2	309	9.77	302.49	15.4
5.8	0.76	327.7%	BHP	95.19	3	463	14.15	303.24	15.5
			P. 3540/MIN	4.49	4	613	18.74	303.99	15.5
			DESORP RATE	167.15	5	772	23.22	304.73	15.5
			SURFACE T	301.0	6	926	27.71	305.48	15.5
			BHT K	316.68	7	1081	32.19	306.23	15.5
			Uq	32	8	1235	36.68	306.97	15.5
			BHT F	110	9	1389	41.16	307.72	15.1
					10	1544	45.65	308.47	15.1
					11	1698	50.13	309.21	15.3
					12	1853	54.62	309.96	15.0
					13	2007	59.10	310.71	15.3
					14	2161	63.59	311.45	14.9
					15	2316	68.08	312.20	14.9
					16	2470	72.56	312.95	14.9
					17	2624	77.05	313.69	14.8
					18	2779	81.53	314.44	14.8
					19	2933	86.02	315.19	14.8
					20	3088	90.50	315.93	14.7
					21	3242	94.99	316.68	14.7
VOL DESORBED DURING BOTTOMS UP							32.4		331.5
VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED							40.4		30.9
VOL CORRECTION FACTOR							1.14		2.02
TOTAL AMOUNT OF GAS DESORBED							27.9 CF/T		38.4 SCF
							0.9 ml/g		1.2 ml/g

LOG DESORP. RATE VS. CUM % RATE

ROSA No.203: FR4.3242-3245



CANNISTER RR6
 NORTHWEST PIPELINE CORP. ROSA #203
 EE/EE SECTION 16 TOWN 35W
 R10 HARRIS COUNTY, NEW MEXICO
 INTERVAL DEPTH: 3257-3269

TIME COAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	SAMP.WT.	610 g
16-Oct-88 17 : 3	20.00 MIN	0.09	TOTAL GAS	2,625 ml
TIME COAL ARRIVED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT OF COAL:	
16-Oct-88 17 :23	22.00 MIN	0.45	Surf. cond.:	STP cond.:
TIME CANNISTER SEALED:	T25%:	VOLUME CORRECTION	188.0 SCF/T	144.2 SCF/T
16-Oct-88 17 :30	27.06 MIN	1.328	5.71 ml/g	4.50 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	V9STP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	17 :35	0.08	0	630	25.0	23.90	0.80	630	486.4	24.0%
16-Oct-88	18 :35	1.08	0	765	20.0	23.90	0.80	765	600.7	53.1%
16-Oct-88	18 :54	1.40	0	470	18.0	23.90	0.80	470	371.6	71.0%
16-Oct-88	21 : 4	3.57	0	280	24.0	24.70	0.83	280	224.1	81.7%
17-Oct-88	8 :52	15.37	0	295	23.0	24.70	0.83	295	237.0	93.0%
18-Oct-88	8 :26	38.93	0	90	21.0	24.80	0.83	90	73.1	96.4%
19-Oct-88	9 : 8	63.63	0	40	21.0	24.60	0.82	40	32.2	97.9%
19-Oct-88	16 :24	70.90	0	55	25.0	24.60	0.82	55	43.7	100.0%
20-Oct-88	9 :25	87.92	0	0	20.0	24.50	0.82	0	0.0	100.0%

TOTAL CH4 DESORBED: 2,625 2,069

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

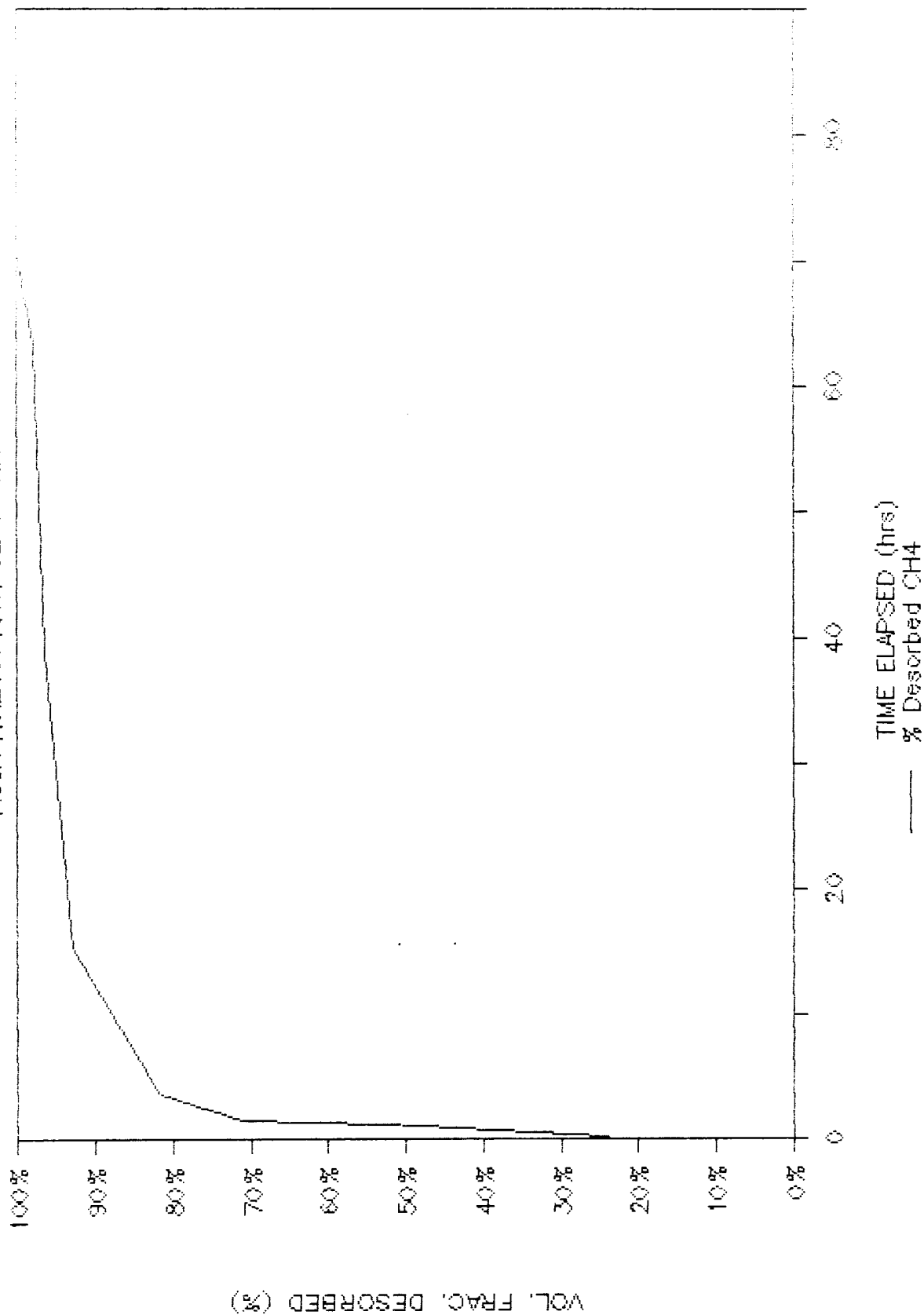
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

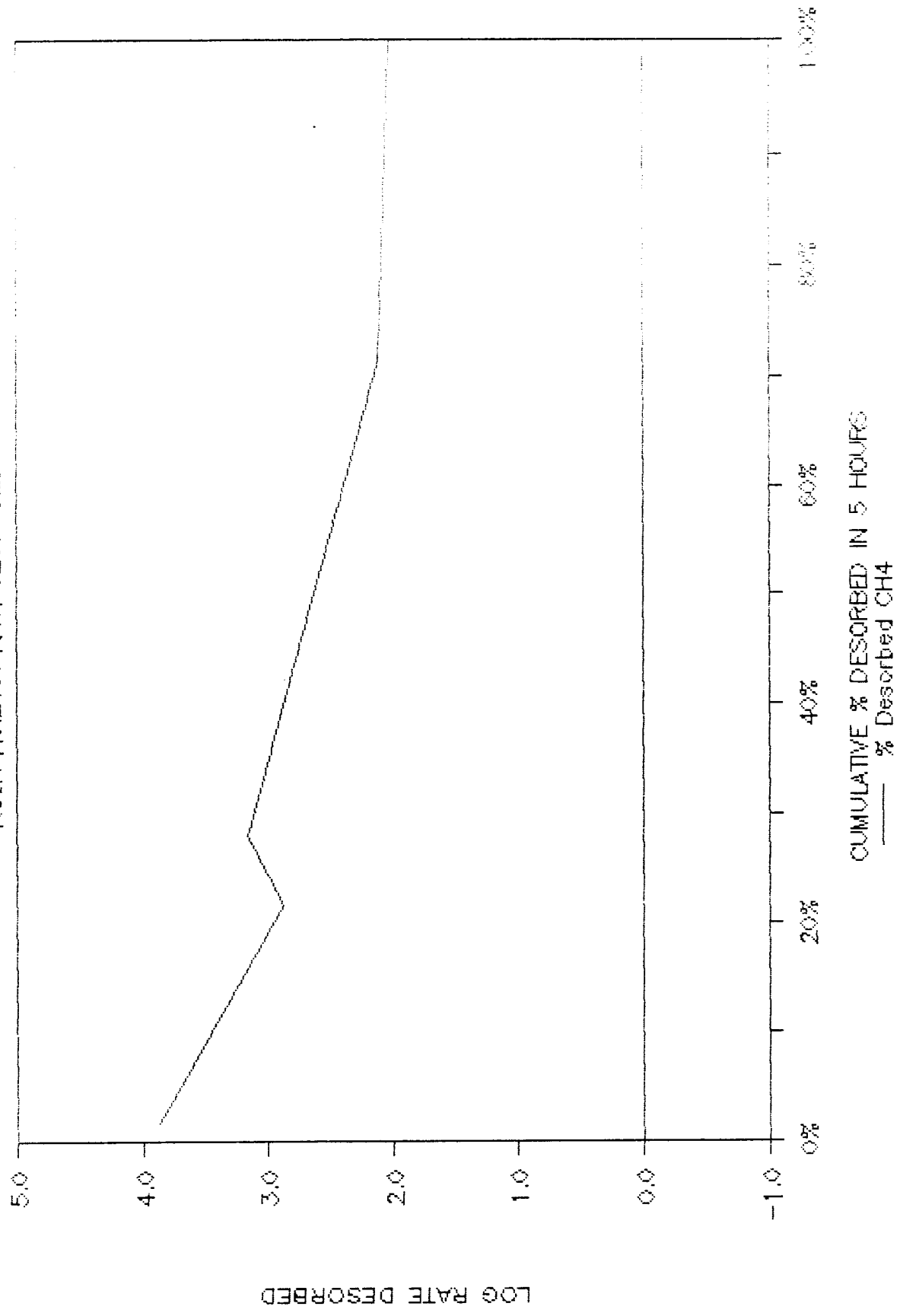
ROGA No.203; PRG. 3257-3259



DESORP. RATE	LOG RATE	CUM. % 5 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (atm)	V G AMS. PRESSURE	T AMS. (K)	V387P ml
7560.0	8.88	1.7%	DEPTH	3257	0	0.80	157.7	301.00	120.6
765.0	2.88	21.7%	LAG TIME	20	1	1.83	5.53	301.73	120.2
1484.2	8.17	23.3%	MUD WT	8.3	2	326	19.26	302.57	119.9
109.2	2.11	71.3%	BHP	95.63	3	489	14.39	303.35	119.6
25.0	1.40	907.3%	P. GRAD/MIN	4.73	4	651	19.72	304.14	119.3
			DESORP RATE	126.00	5	314	24.46	304.92	119.0
			SURFACE T	301.0	6	377	29.19	305.70	118.7
			BHT K	316.68	7	1140	33.92	306.49	118.4
			Qa	252	8	1303	38.65	307.27	118.1
			BHT F	110	9	1466	43.38	308.06	117.8
					10	1629	48.11	308.84	117.5
					11	1791	52.84	309.62	117.2
					12	1954	57.58	310.41	116.9
					13	2117	62.31	311.19	116.6
					14	2280	67.04	311.98	116.3
					15	2443	71.77	312.76	116.0
					16	2606	76.50	313.54	115.7
					17	2768	81.23	314.33	115.4
					18	2931	85.96	315.11	115.2
					19	3094	90.69	315.90	114.9
					20	3257	95.43	316.68	114.6
			VOL DESORBED DURING BOTTOMS UP				247.2		2468.0
			VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED				315.5		241.1
			VOL CORRECTION FACTOR				1.19		2.31
			TOTAL AMOUNT OF GAS DESORBED				163.7 CF/T 5.1 ml/g		250.8 SCF 7.8 ml/

LOG DESORP. RATE VS. CUM % RATE

RCSA No.203: RR6, 3257-3259



CANNISTER RR8
 NORTHWEST PIPELINE CORP. BOGA #200
 SEASE SECTION 13 TOWN 95W
 RIO ARriba COUNTY, NEW MEXICO
 INTERVAL DEPTH:3170-3275

TIME COAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	BAMP/WT.	851 g
16-Oct-88 17:45	16.00 MIN	0.10	TOTAL GAS	3,915 ml
TIME COAL ARRIVED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT IF COAL:	
16-Oct-88 18:16	20.00 MIN	0.68	Surf. cond.:	STP cond.:
TIME CANNISTER SEALED:	T25%:	VOLUME CORRECTION	186.2 CF/IT	140.7 SCF/IT
16-Oct-88 18:10	33.10 MIN	1.264	5.81 ml/g	4.61 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	V95TP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	18:24	0.23	0	845	20.0	23.90	0.80	845	663.5	21.6%
16-Oct-88	18:31	0.35	0	650	20.0	23.90	0.80	850	667.4	43.3%
16-Oct-88	18:52	0.70	0	710	18.0	23.90	0.80	710	561.3	61.4%
16-Oct-88	21:3	2.88	0	630	24.0	24.70	0.83	630	504.3	77.5%
17-Oct-88	8:50	14.67	0	455	23.0	24.70	0.83	455	365.5	89.1%
18-Oct-88	8:25	38.25	0	250	21.0	24.80	0.83	250	203.0	95.5%
19-Oct-88	9:9	62.98	0	95	21.0	24.60	0.82	95	76.5	98.0%
19-Oct-88	16:25	70.25	0	80	25.0	24.60	0.82	80	63.6	100.0%
20-Oct-88	9:26	87.27	0	0	20.0	24.50	0.82	0	0.0	100.0%

TOTAL CH4 DESORBED: 3,915 3,105

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

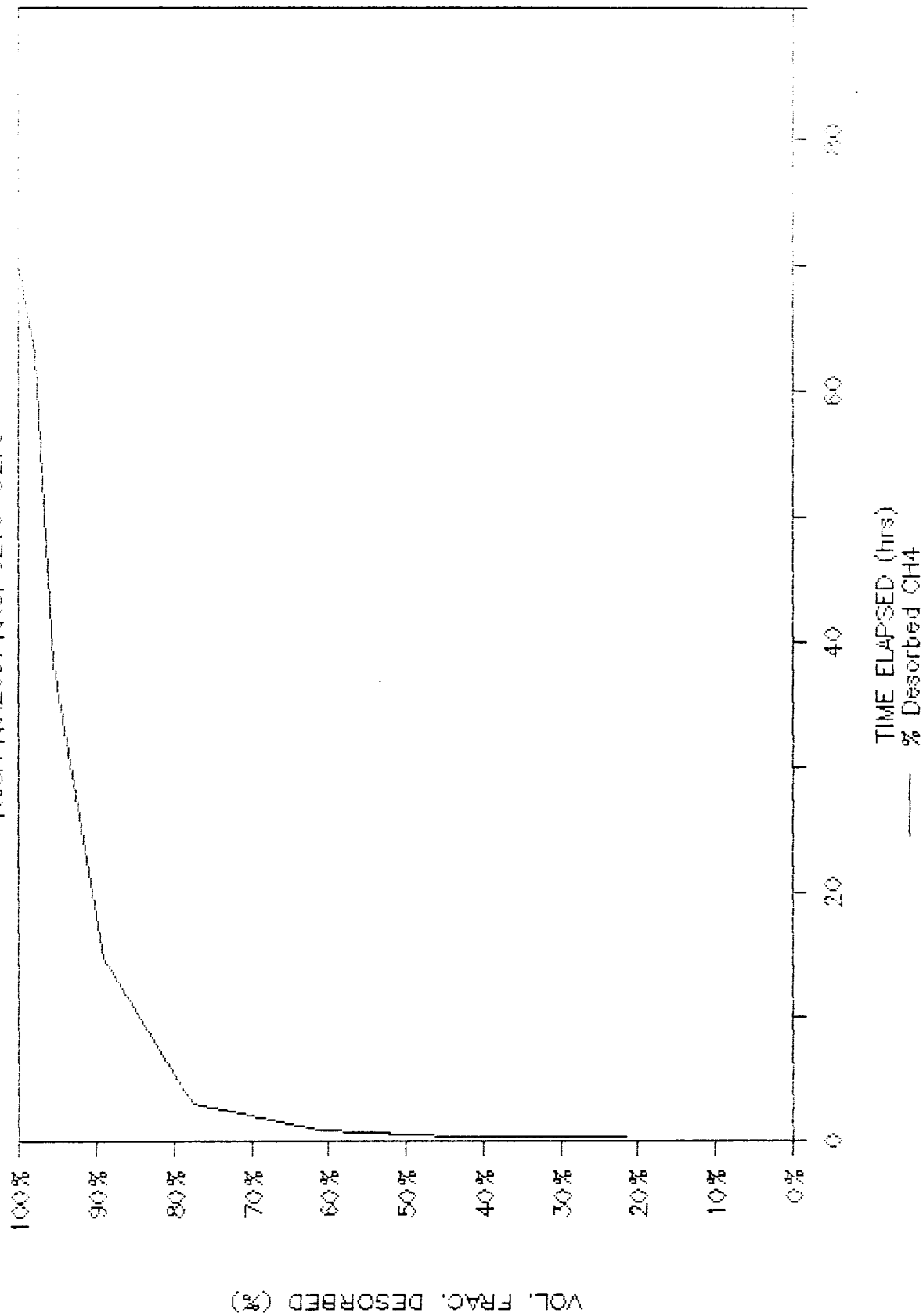
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

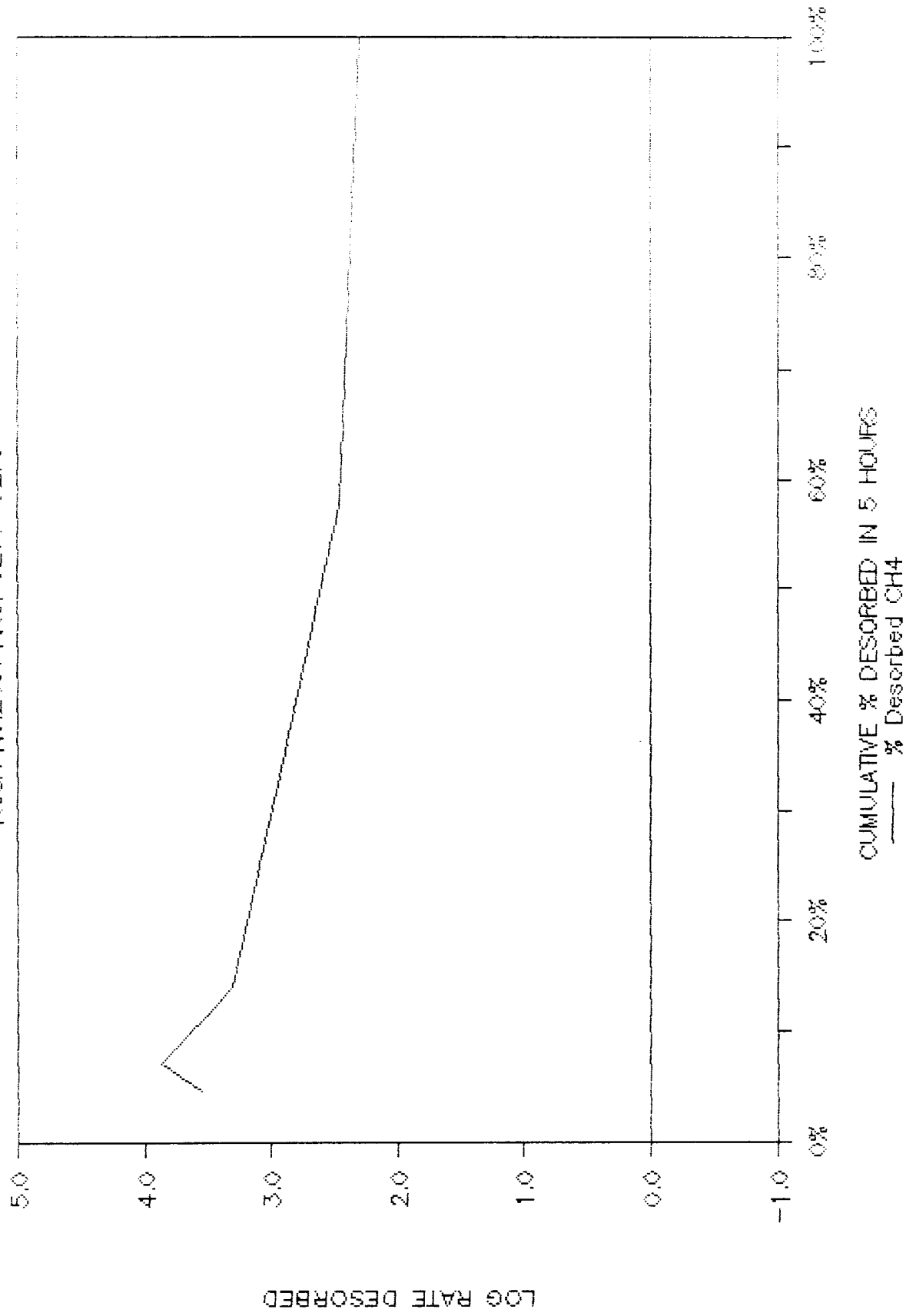
ROSA No 203; RR8, 3270-3275



DESORP. RATE	LOG RATE	CCM. % 3 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (atm)	V G AMS. PRESSURE	T AMS. (K)	V G STP (ml)
3421.4	3.36	4.7%	DEPTH	3270	0	0.60	75.6	301.00	57.3
7385.7	3.36	7.0%	LAG TIME	18	1	1.62	8.09	301.67	57.6
1029.6	3.31	14.3%	MUD WT	9.3	2	3.68	11.36	302.74	57.4
133.5	2.46	57.7%	SRP	86.01	3	5.95	16.63	303.61	57.3
35.6	1.58	249.3%	R, GRAD/MIN	5.28	4	7.27	21.91	304.48	57.1
			DESORP RATE	60.36	5	10.8	27.19	305.36	56.9
			SURFACE T	301.0	6	10.90	32.47	306.23	56.8
			SHT K	316.68	7	12.72	37.75	307.10	56.6
			Vg	121	8	14.53	43.03	307.97	56.4
			SHT F	110	9	16.35	48.30	308.84	56.3
					10	18.17	53.58	309.71	56.1
					11	19.98	58.86	310.58	56.0
					12	21.80	64.14	311.45	55.8
					13	23.62	69.42	312.32	55.7
					14	25.43	74.69	313.20	55.5
					15	27.25	79.97	314.07	55.3
					16	29.07	85.25	314.94	55.2
					17	30.88	90.53	315.81	55.0
					18	32.70	95.81	316.68	54.9
VOL DESORBED DURING BOTTOMS UP							113.1		1069.7
VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED							151.1		115.5
VOL CORRECTION FACTOR							1.06		1.38
TOTAL AMOUNT OF GAS DESORBED							155.8 CF/T 4.9 ml/g		161.4 SCF 5.0 ml/

LOG DESORP. RATE VS. CUM. % RATE

ROSA No. 203: RR8, 3270-3275



CHAMISTER RR11
 NORTHWEST PIPELINE CORP. BOBA #203
 REUSE SECTION 13 TOWN REM
 RIO ARriba COUNTY, NEW MEXICO
 INTERVAL DEPTH-10273-9280

TIME COAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	SAMP.WT.	913 g
16-Oct-88 17:455	16.00 MIN	0.11	TOTAL GAS	4,925 ml
TIME COAL ARRIVED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT OF COAL:	
16-Oct-88 18:111	16.00 MIN	0.39	Surf. cond.:	STP cond.:
TIME CHAMISTER SEALED:	T25%:	VOLUME CORRECTION	219.7 CF/AT	174.2 SCF/AT
16-Oct-88 18:113	23.74 MIN	1.279	6.56 ml/g	5.44 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	V@STP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	18:25	0.20	0	900	20.0	23.90	0.80	900	706.6	18.3%
16-Oct-88	18:27	0.23	0	900	20.0	23.90	0.80	900	706.6	36.5%
16-Oct-88	18:33	0.42	0	605	20.0	23.90	0.80	605	475.0	48.3%
16-Oct-88	18:55	0.70	0	525	18.0	23.90	0.80	525	415.0	59.5%
16-Oct-88	21:1	2.80	0	830	24.0	24.70	0.83	830	664.4	76.3%
17-Oct-88	8:49	14.60	0	650	23.0	24.70	0.83	650	522.1	89.5%
18-Oct-88	8:23	38.17	0	260	21.0	24.80	0.83	260	211.1	94.8%
19-Oct-88	9:10	62.95	0	140	21.0	24.60	0.82	140	112.8	97.7%
20-Oct-88	16:26	94.22	0	115	25.0	24.60	0.82	115	91.4	100.0%
19-Oct-88	9:27	63.23	0	0	20.0	24.50	0.82	0	0.0	100.0%

TOTAL CH4 DESORBED: 4,925 3,905

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

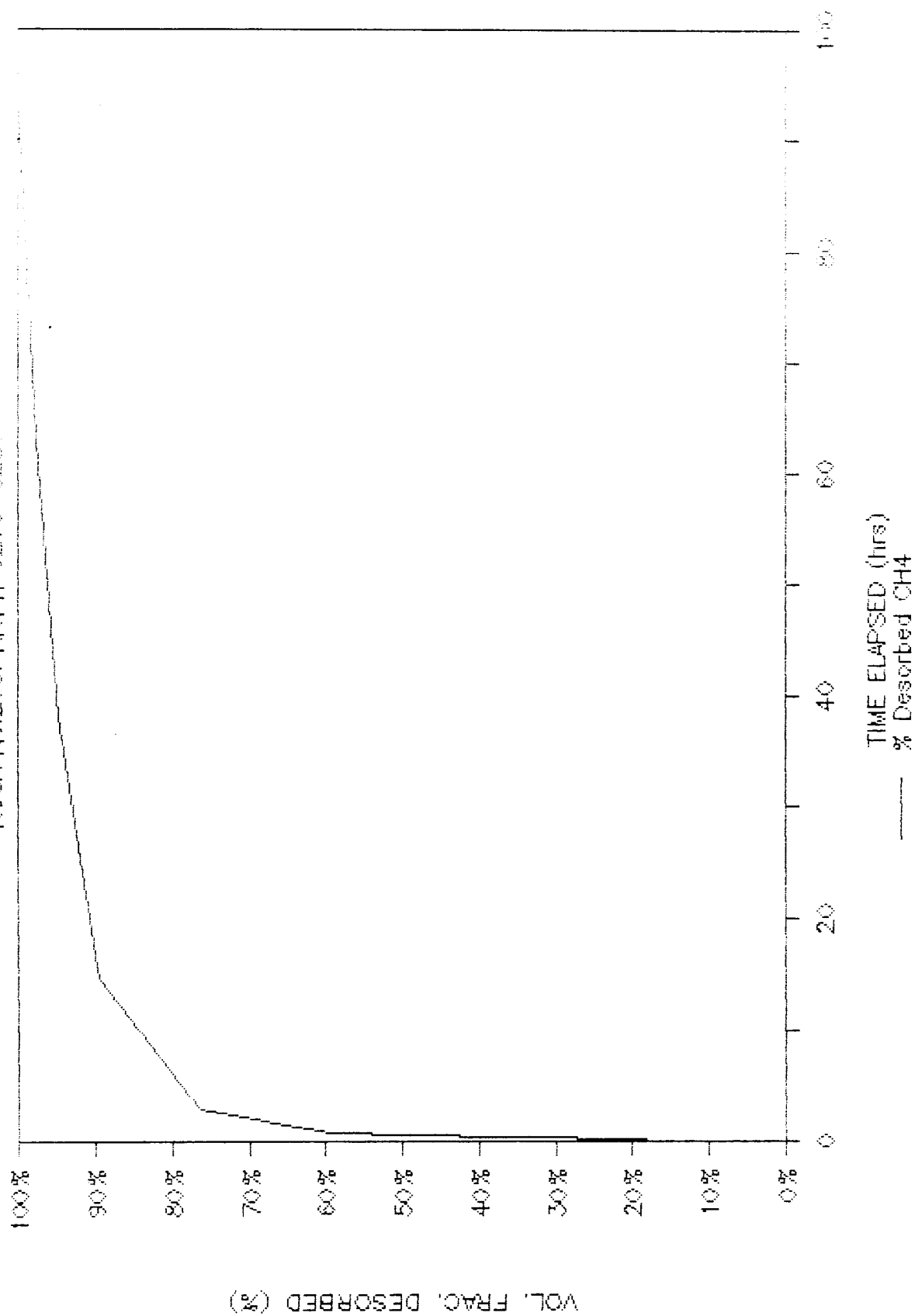
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

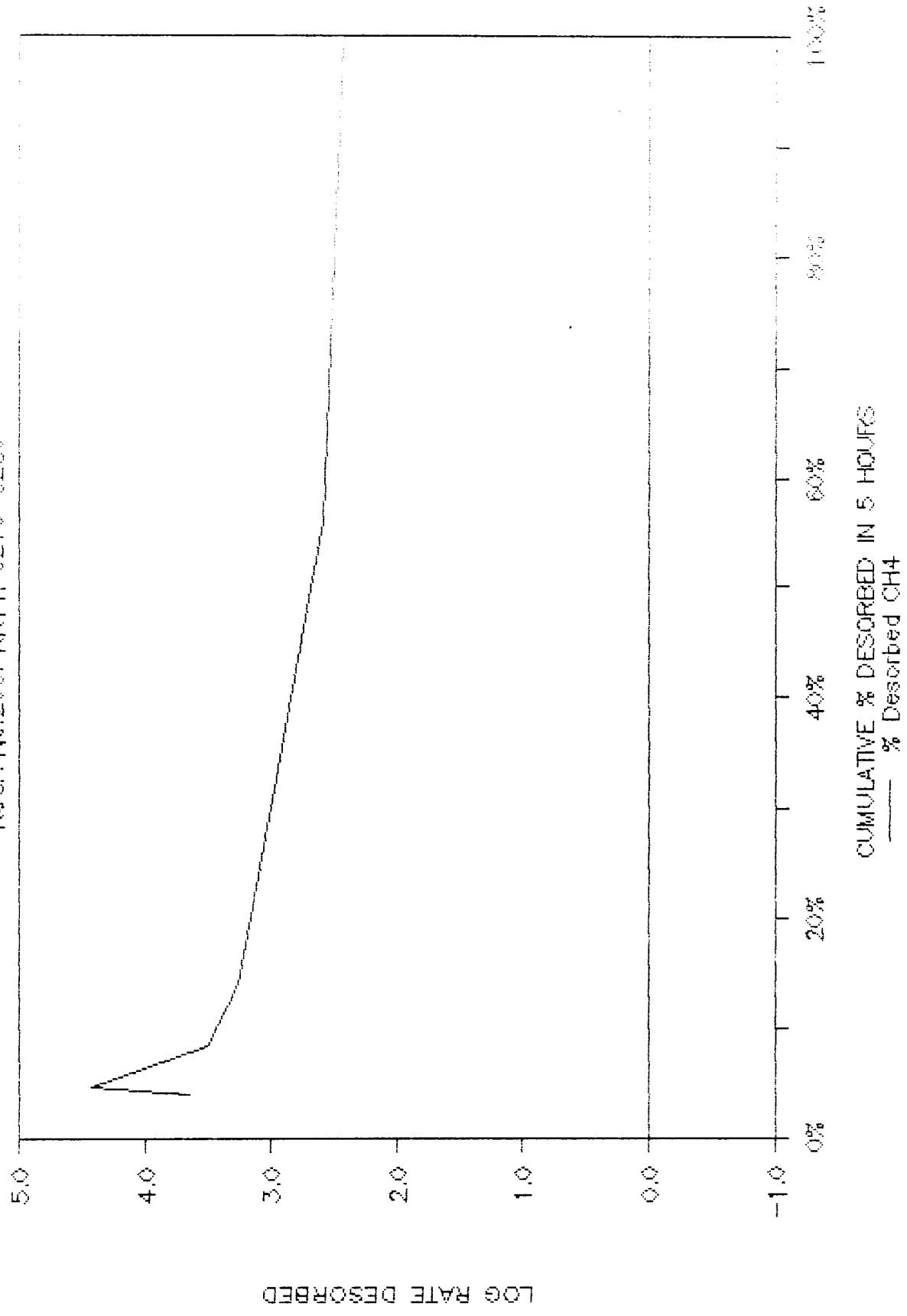
ROSA No.203; RR11, 3276-3280



DESORP. RATE	LOG RATE	CUM. % 5 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (atm)	V D AMB. PRESSURE	T AMB. (K)	VGSTR ml
4500.0	0.65	4.0%	DEPTH	3276	0	0.00	75.9	301.00	71.3
27000.0	4.48	4.7%	LAG TIME	16	1	205	6.75	301.68	71.5
32000.0	3.52	5.0%	MUD WT	8.3	2	410	12.70	302.96	71.6
13527.9	3.27	14.0%	BHP	96.19	3	614	18.95	303.94	71.1
3951.2	2.60	36.0%	P. GRAD/MIN	5.95	4	819	24.90	304.92	70.6
55.1	1.74	292.0%	DESORP RATE	75.00	5	1024	30.54	305.90	70.6
			SURFACE T	301.0	6	1229	36.49	306.88	70.4
			BHT K	316.68	7	1403	42.44	307.86	70.2
			Vg	150	8	1608	48.39	308.84	69.9
			BHT F	110	9	1843	54.34	309.82	69.7
					10	2048	60.29	310.80	69.5
					11	2252	66.24	311.78	69.3
					12	2457	72.19	312.76	69.1
					13	2662	78.14	313.74	68.8
					14	2867	84.09	314.72	68.6
					15	3071	90.03	315.70	68.4
					16	3276	95.98	316.68	68.2
VOL DESORBED DURING BOTTOMS UP							134.1		1189.3
VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED							187.8		143.5
VOL CORRECTION FACTOR							1.05		1.34
TOTAL AMOUNT OF GAS DESORBED							181.1 CF/T 5.7 ml/g		182.7 SCF 5.7 ml/g

LOG DESORP. RATE VS. CUM. % RATH

ROSA No.203: RR11, 3276-3280



DANNISTER RR12
 NORTHWEST PIPELINE CORP. BOCA 4203
 SE 35 SECTION 18 T10N R24E
 RIO ARriba COUNTY, NEW MEXICO
 INTERVAL DEPTH: 3282-3333

TIME COAL SEAM PENETRATED:	Td:	SURFACE TIME RATIO:	SAMP. WT.	1012 g
16-Oct-88 17 :59	16.00 MIN	0.11	TOTAL GAS	7,020 ml
TIME COAL ARRIVED TO SURFACE:	Ts:	LOST TIME RATIO:	GAS CONTENT OF COAL:	
16-Oct-88 18 :15	18.00 MIN	0.83	Surf. conc.:	STP conc.:
TIME DANNISTER SEALED:	T25%:	VOLUME CORRECTION	281.4 CF/T	228.3 SCF/T
16-Oct-88 18 :17	29.00 MIN	1.267	8.79 ml/g	6.98 ml/g

DATE	TIME(h)	TIME(h)	VOLUME(ml)	VOLUME(ml)	T amb	P	P	DELTA V	VSTP	VOL. FRAC.
	0-2400	ELAPSED	START	FINISH	deg. C	atm	atm	ml	ml	DESORBED
16-Oct-88	18 :29	0.20	0	930	20.0	23.90	0.80	930	730.2	13.2%
16-Oct-88	18 :30	0.22	0	825	20.0	23.90	0.80	825	647.8	25.0%
16-Oct-88	18 :33	0.27	0	810	20.0	23.90	0.80	810	636.0	36.5%
16-Oct-88	18 :51	0.57	0	755	18.0	23.90	0.80	755	596.9	47.3%
16-Oct-88	18 :56	0.65	0	480	18.0	23.90	0.80	480	379.5	54.1%
16-Oct-88	20 :59	2.70	0	840	24.0	24.70	0.83	840	672.4	66.1%
16-Oct-88	21 : 0	2.72	0	525	24.0	24.70	0.83	525	420.3	73.6%
17-Oct-88	8 :46	14.48	0	815	23.0	24.70	0.83	815	654.6	85.2%
17-Oct-88	8 :48	14.52	0	185	23.0	24.70	0.83	185	148.6	87.8%
18-Oct-88	8 :21	38.07	0	510	21.0	24.80	0.83	510	414.1	95.1%
19-Oct-88	9 :11	62.90	0	225	21.0	24.60	0.82	225	181.2	98.3%
19-Oct-88	16 :27	70.17	0	120	25.0	24.60	0.82	120	95.4	100.0%
20-Oct-88	9 :28	87.18	0	0	20.0	24.50	0.82	0	0.0	100.0%

TOTAL CH4 DESORBED: 7,020 5,577

Td=the time from seam penetration to sample surfacing.

Ts=the time from seam penetration to container sealing.

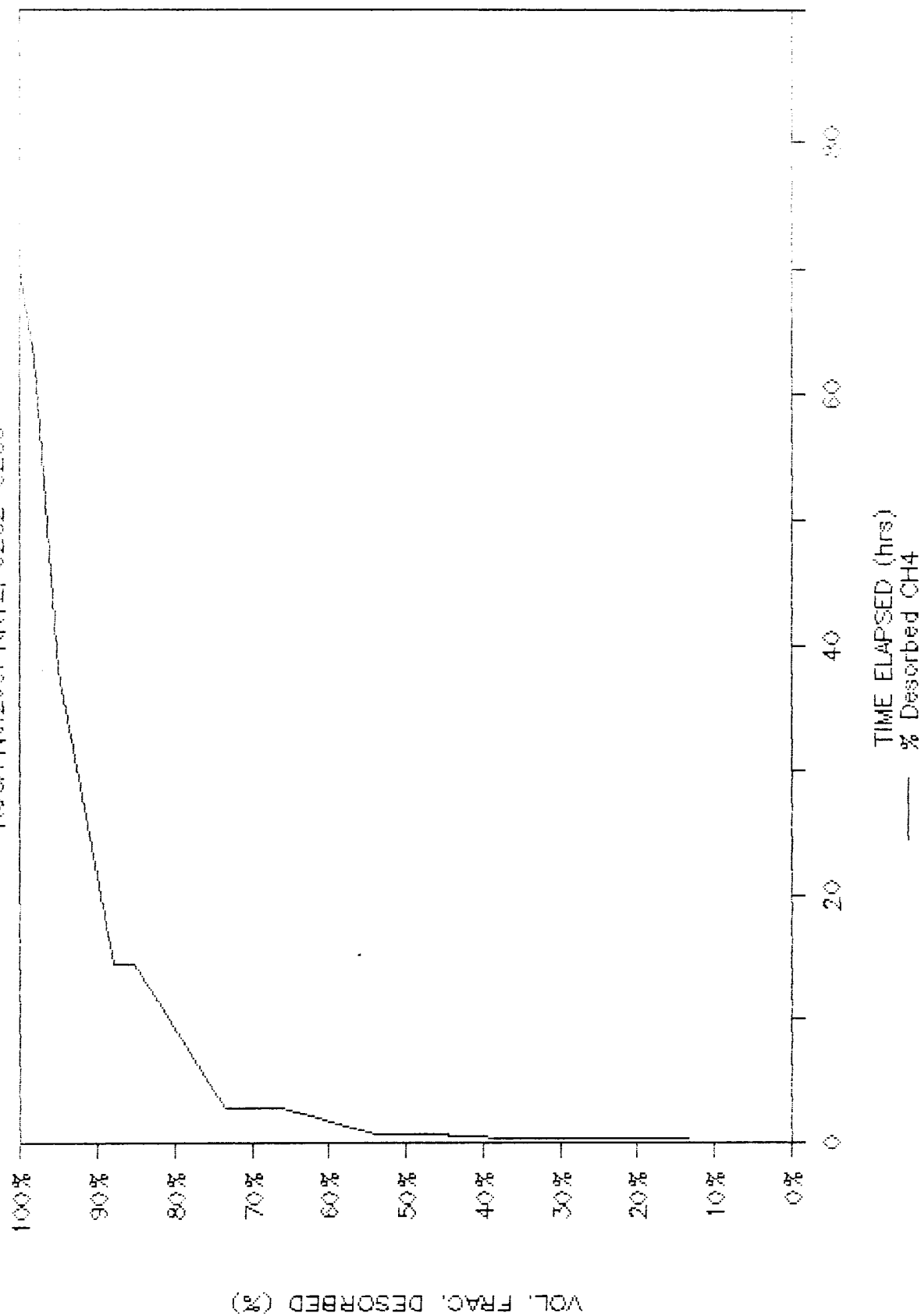
T25%=the time from seam penetration to the time when 25% of the measured volume has desorbed.

Surface time ratio=(Ts-Td)/Ts

Lost time ratio=Ts/(T25%+Ts)

TIME ELAPSED VS. % VOL. CH4 DESORBED

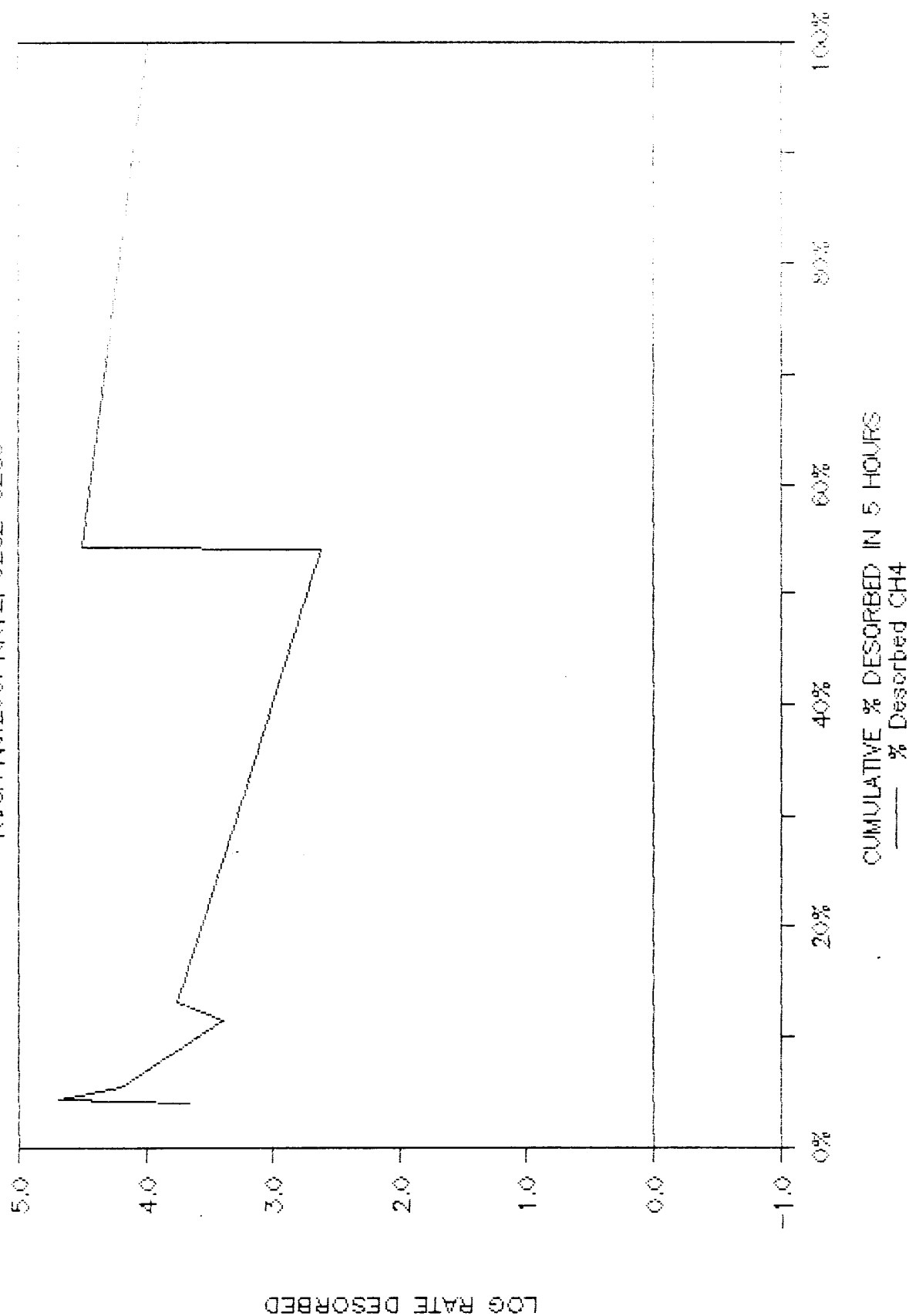
ROSA No.203: RR12, 3282-3288



DESORP. RATE	LOG RATE	CCM. % 5 HOURS		MIN FROM SURFACE	DEPTH	PRESSURE (atm)	VOL AMB. PRESSURE	T AMB. (°C)	VOL STP (ml)	
4850.0	3.67	4.0%	DEPTH	3282	0	0.90	37.0	301.00	74.2	
49500.0	4.69	4.0%	LAG TIME	10	1	205	5.75	10.5	301.98	73.9
10000.0	4.21	5.0%	MUD WT	8.3	2	410	12.72	5.1	302.96	73.7
2516.7	3.40	11.0%	BHP	96.66	3	615	13.68	4.1	303.94	73.4
5750.0	3.76	16.0%	R. GRAD/MIN	5.96	4	821	24.64	3.1	304.92	73.2
469.8	2.61	54.0%	DESORP RATE	77.60	5	1026	30.60	2.5	305.90	73.0
31500.0	4.50	54.0%	SURFACE T	301.0	6	1231	36.56	2.1	306.88	72.7
69.8	1.84	169.7%	BHT K	313.68	7	1436	42.52	1.8	307.86	72.5
			U ₀	135	8	1641	48.48	1.6	308.84	72.3
			BHT F	110	9	1846	54.44	1.4	309.82	72.0
					10	2051	60.40	1.3	310.80	71.8
					11	2256	66.36	1.2	311.78	71.6
					12	2462	72.32	1.1	312.76	71.4
					13	2667	78.28	1.0	313.74	71.1
					14	2872	84.24	0.9	314.72	70.9
					15	3077	90.20	0.9	315.70	70.7
					16	3282	96.16	0.8	316.68	70.5
VOL DESORBED DURING BOTTOMS UP							138.5		1228.9	
VOL DESORBED AT SURFACE BEFORE CANNISTER IS SEALED							194.0		148.3	
VOL CORRECTION FACTOR							1.04		1.25	
TOTAL AMOUNT OF GAS DESORBED							230.9 CF/T 7.2 ml/g		220.0 SCF 6.9 ml/g	

LOG DESORP. RATE VS. CUM. % RAIL

ROSA No.203: RR12, 3282-3288



REFERENCES

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