	1st Min.	2nd Min.
Flow Time	10	60
Closed In Press. Time	22	30
Pressure Readings	Field	Office Corrected
Depth Top Gauge	3508 Ft.	no Blanked Off
BT. P.R.D. No.	534	12 Hour Clock
Initial Hydro Mud Pressure	1941	1945
Initial Closed in Pres.	1202	1206
Initial Flow Pres.	29 (1)	43 (1)
	38 (2)	56 (2)
Final Flow Pres.	48 (1)	39 (1)
	77 (2)	78 (2)
Final Closed in Pres.	928	936
Final Hydro Mud Pressure	1931	1934
Depth Cen. Gauge	Ft.	Blanked Off
BT. P.R.D. No.		Hour Clock
Initial Hydro Mud Pres.		
Initial Closed in Pres.		
Initial Flow Pres.	1	
	2	
Final Flow Pres.	1	
	2	
Final Closed in Pres.		
Final Hydro Mud Pres.		
Depth Bot. Gauge	3534 Ft.	yes Blanked Off
BT. P.R.D. No.	533	12 Hour Clock
Initial Hydro Mud Pres.	1954	1963
Initial Closed in Pres.	1202	1210
Initial Flow Pres.	38 (1)	57 (1)
	48 (2)	83 (2)
Final Flow Pres.	57 (1)	57 (1)
	86 (2)	95 (2)
Final Closed in Pres.	945	950
Final Hydro Mud Pres.	1944	1946

Date 6-8-65 | Ticket Number 423421 S

Kind of Job OPEN HOLE | Halliburton District PRATT

Tester L.J. CLINE | Witness WILLIAM CAPPS

Drilling Contractor A.L. JACKSON LC

Elevation 1565' DF | Top Packer 3501'

Total Depth 3538' | Bottom Packer 3506'

Interval Tested Net pay 7' 3506' - 3538' | Formation Tested Kansas City

Casing or Hole Size 9" | Casing Perfs. Top / Bot.

Surface Choke 1" | Bottom Choke 3/4"

Size & Kind Drill Pipe 4 ½" FH | Drill Collars Above Tester (I.D. - LENGTH) none

Mud Weight 10.6 | Mud Viscosity 39

Temperature 105 °F Est. / °F Actual | Anchor Size & Length ID 3.87" OD 5" X 32'

Depths Mea. From Kelly Bushing | Depth of Tester Valve 3494 Ft.

Cushion (TYPE) - (AMOUNT) Ft. | Depth Back Pres. Valve - Ft.

Recovered 215 Feet of heavy oil & gas cut mud.

Recovered Feet of

Recovered Feet of

Recovered Feet of

Oil A.P.I. Gravity | Water Spec. Gravity

Gas Gravity | Surface Pressure psi

Tool Opened 7:05 A.M. P.M. | Tool Closed 9:02 A.M. P.M.

Remarks Tool opened for a 10 minute first flow. Took a 22 minute initial closed in pressure. Reopened tool for a 60 minute second flow with a strong blow. Gas to surface in 38 minutes, too weak to gauge. Closed tool for a 30 minute final closed in pressure.

Legal Location Sec. - Twp. - Rng. 23 25S 8W NW NE NE

Lease Name KREHBIEL | Well No. 2 | Test No. 1

Lease Owner/Company Name E.H. RIGGS

Field Area | County RENO | State KANSAS

Owner's District KANSAS

Mea. From Tester Valve

Dec. 23.

FORMATION TEST DATA

Gauge No. 534	Depth 3508'	Clock 12 hour	Ticket No. 423421

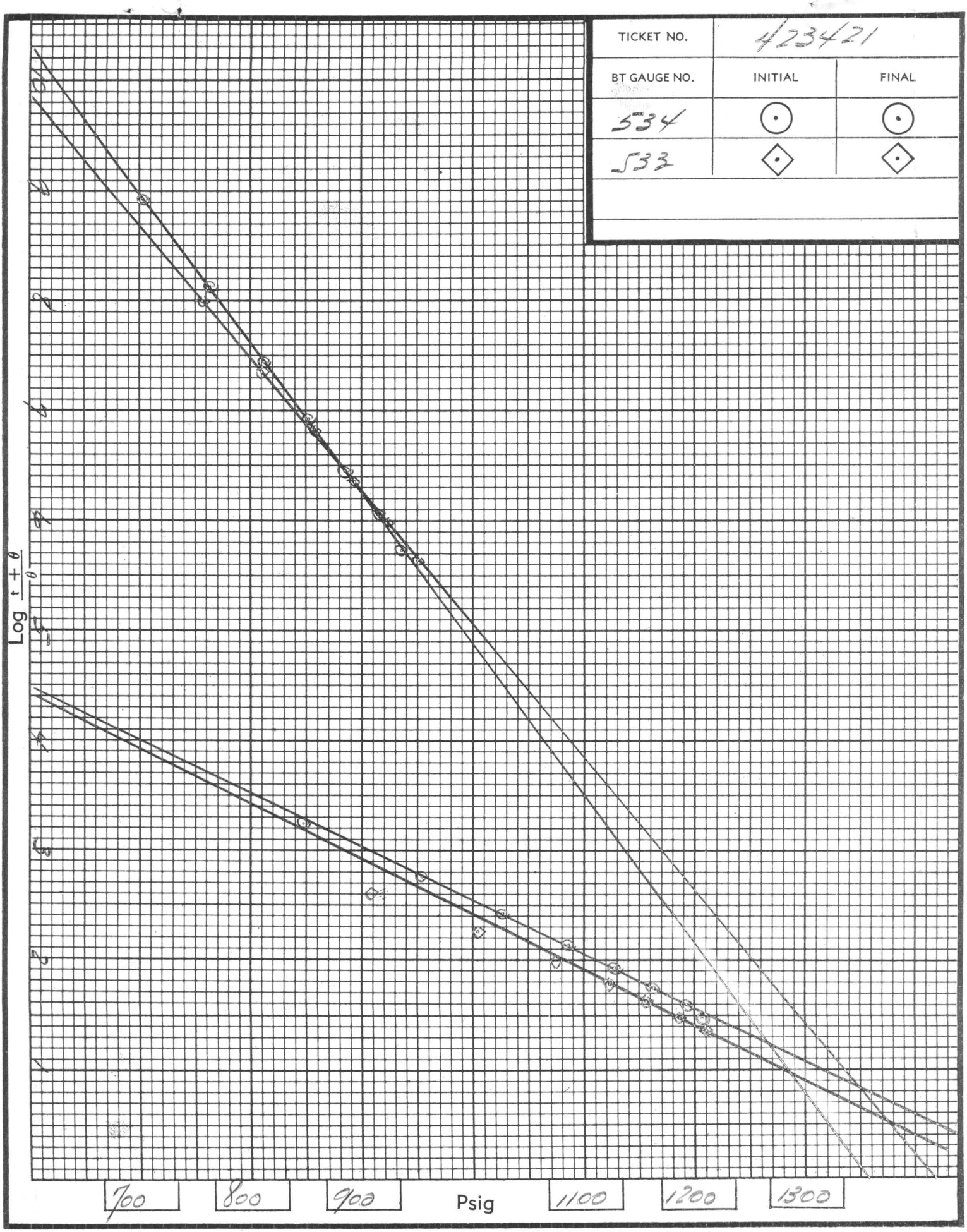
	First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
P_0	.000	43	.000	-	39	.000	56	.000	-	78
P_1	.0126	31	.0141	.737	254	.1028	56	.0173	1.453	288
P_2	.0252	32	.0282	.509	464	.2056	64	.0346	1.167	475
P_3	.0378	34	.0423	.396	680	.3084	71	.0519	1.005	612
P_4	.0504	36	.0564	.325	848	.4110	78	.0692	.894	702
P_5	.0630	39	.0705	.277	953			.0865	.811	764
P_6		*	.0846	.241	1027			.1038	.745	811
P_7			.0987	.214	1087			.1211	.691	852
P_8			.1128	.192	1129			.1384	.645	885
P_9			.1269	.175	1164			.1557	.606	915
P_{10}			.1410 .1550	.160 .148	1191 1206			.1730	.572	936

Gauge No. 533			Depth 3534'			Clock 12		hour		
P_0	.000	57	.000	-	57	.000	83	.000	-	95
P_1	.0114	52	.0139	.707	195	.1015	73	.0174	1.441	244
P_2	.0228	53	.0278	.484	375	.2030	81	.0348	1.155	428
P_3	.0342	54	.0417	.374	603	.3045	88	.0522	.994	582
P_4	.0456	55	.0556	.306	774	.4060	95	.0696	.883	684
P_5	.0570	57	.0695	.260	909			.0870	.800	757
P_6			.0834	.226	1003			.1044	.735	810
P_7			.0973	.200	1073			.1218	.681	856
P_8			.1112	.179	1021			.1392	.636	893
P_9			.1251	.163	1158			.1566	.597	923
P_{10}			.1390 .1530	.149 .137	1187 1210			.1740	.563	950
Reading Interval		2		2			15		3	Minutes

REMARKS:

SPECIAL PRESSURE DATA

TICKET NO.	423421	
BT GAUGE NO.	INITIAL	FINAL
534	⊙	⊙
533	◇	◇



EXTRAPOLATED PRESSURE GRAPH

Liquid Production

B.T. Gauge Numbers			534	533	Ticket Number		423421	
			PRESSURE	PRESSURE				
Initial Hydrostatic			1945	1963	Elevation		1565	ft.
Final Hydrostatic			1934	1946	Indicated Production	1st Flow	-	bbls. day
		Time				Total Flow	27.6	bbls. day
1st Flow	Initial	————	43	57				
	Final		39	57	Drill Collar Length		-	ft.
Initial Closed In Pressure			1206	1210	Drill Collar I.D.		-	in.
2nd Flow	Initial	————	56	83	Drill Pipe Factor		0.0142	bbls. ft.
	Final		78	95	Hole Size		9	in.
Final Closed In Pressure			936	950	Footage Tested		7 Net	ft.
Extrapolated Static Pressure	Initial		-	-	Mud Weight		10.6	lbs. gal.
	Final		1358	1418	Viscosity, Oil or Water		3.8	cp
Slope psi/cycle	Initial		-	-	Oil API Gravity		38 Est.	—
	Final		622	595	Water Specific Gravity		-	—

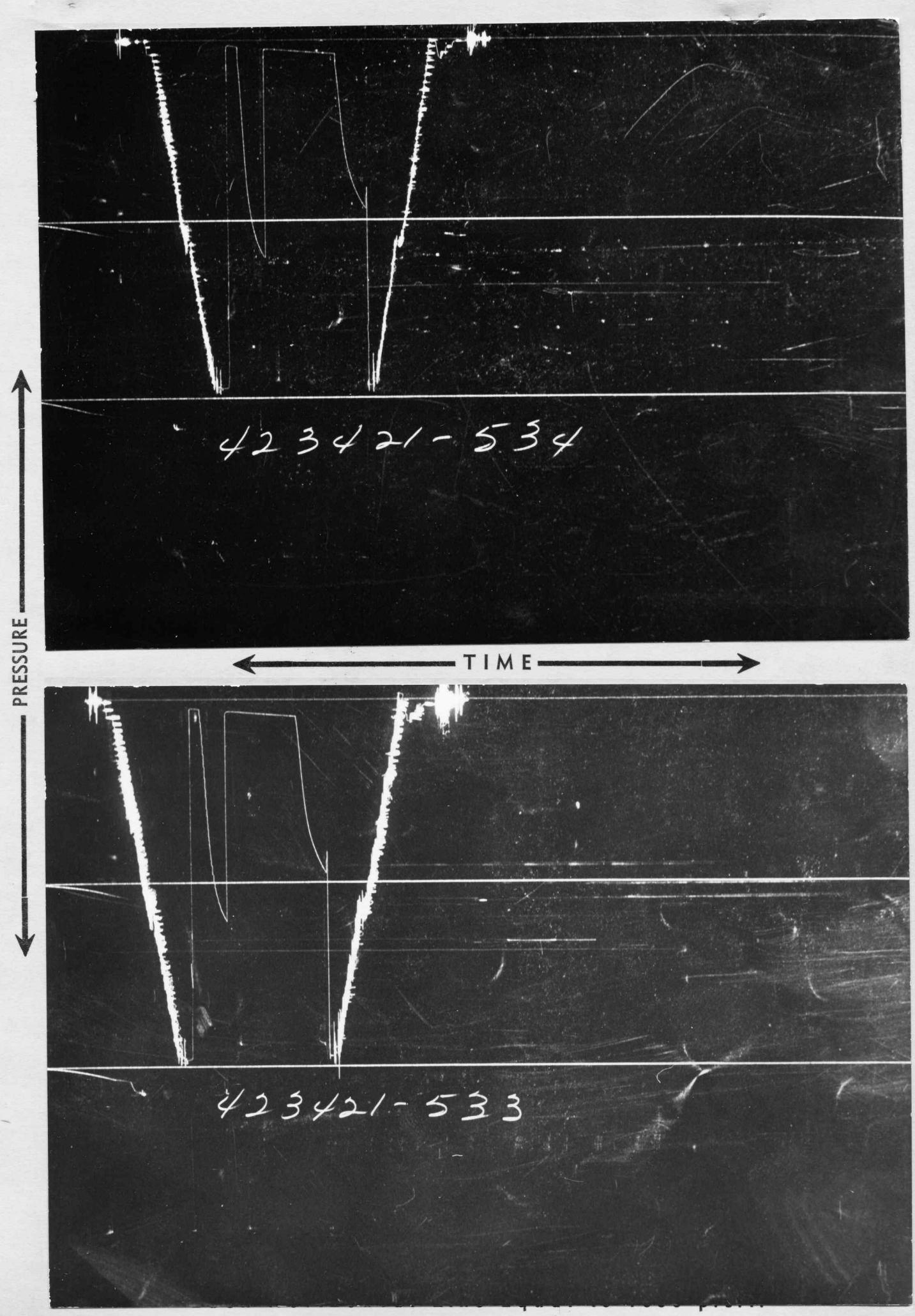
Remarks: _____

SUMMARY

Product	Equation	Gauge No. 534 Depth 3508' Initial	Gauge No. 534 Depth 3508' Final	Gauge No. 533 Depth 3534' Initial	Gauge No. 533 Depth 3534' Final	Units
Production	$Q = \frac{1440\ R}{t}$		27.6		27.6	bbls. day
Transmissability	$\frac{Kh}{\mu} = \frac{162.6\ Q}{m}$		6.1		5.4	md. ft. / cp
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu}\ \mu$		23.2		20.7	md. ft.
Average Effective	$K = \frac{Kh}{h}$		-		-	md.
Permeability	$K_I = \frac{Kh}{h_I}$		3.3		3.0	md.
Damage Ratio	$DR = .183\ \frac{Ps - Pf}{m}$		0.3		0.3	—
Theoretical Potential w/Damage Removed	$Q_1 = Q\ DR$		27.6		27.6	bbls. day
Approx. Radius of Investigation	$b \backsimeq \sqrt{Kt}$ or $\sqrt{Kt_0}$		-		-	ft.
	$b_1 \backsimeq \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		15.2		14.4	ft.
Potentiometric Surface *	$Pot. = El - GD + 2.319\ Ps$		1206.2		1319.3	ft.

NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and evaluations based thereon, Halliburton is merely expressing its opinion. You agree that Halliburton makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Halliburton shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

INTERPRETATIONS AND CALCULATIONS


423421-534
PRESSURE
TIME
423421-533

	1st Min.	2nd Min.
Flow Time	20	60
Closed In Press. Time	45	45
Pressure Readings	Field	Office Corrected
Depth Top Gauge	3758 Ft.	NO Blanked Off
BT. P.R.D. No.	526	12 Hour Clock
Initial Hydro Mud Pressure	2069	2051
Initial Closed in Pres.	1167	1167
Initial Flow Pres.	26 1	36
	35 2	38
Final Flow Pres.	26 1	34
	35 2	37
Final Closed in Pres.	1132	1127
Final Hydro Mud Pressure	2051	2040
Depth Cen. Gauge	Ft.	Blanked Off
BT. P.R.D. No.		Hour Clock
Initial Hydro Mud Pres.		
Initial Closed in Pres.		
Initial Flow Pres.	1	
	2	
Final Flow Pres.	1	
	2	
Final Closed in Pres.		
Final Hydro Mud Pres.		
Depth Bot. Gauge	3765 Ft.	YES Blanked Off
BT. P.R.D. No.	231	12 Hour Clock
Initial Hydro Mud Pres.	2068	2059
Initial Closed in Pres.	1172	1172
Initial Flow Pres.	36 1	45
	54 2	44
Final Flow Pres.	27 1	44
	36 2	42
Final Closed in Pres.	1127	1133
Final Hydro Mud Pres.	2050	2047

Date	6-10-65	Ticket Number	423422 - S
Kind of Job	OPEN HOLE	Halliburton District	PRATT
Tester	MR. CLINE	Witness	MR. CAPPS
Drilling Contractor	A. L. JACKSON		IC
Elevation	1565' D.F.	Top Packer	3751'
Total Depth	3769'	Bottom Packer	3756'
Interval Tested	3756'-3769' (9')	Formation Tested	MISSISSIPPI
Casing or Hole Size	9"	Casing Perfs. Top / Bot.	-
Surface Choke	1"	Bottom Choke	3/4"
Size & Kind Drill Pipe	4 1/2" F.H.	Drill Collars Above Tester (I.D. - LENGTH)	-
Mud Weight	10.3	Mud Viscosity	39
Temperature	107 °F Est. / °F Actual	Anchor Size & Length	ID 3.87" OD 5.00" X 13'
Depths Mea. From	KELLY BUSHINGS	Depth of Tester Valve	3745' Ft.
Cushion (TYPE / AMOUNT)	- Ft.	Depth Back Pres. Valve	- Ft.
Recovered	70 Feet of	Water cut mud	
Recovered	Feet of		
Recovered	Feet of		
Recovered	Feet of		
Oil A.P.I. Gravity	-	Water Spec. Gravity	-
Gas Gravity	-	Surface Pressure	- psi
Tool Opened	4:22 A.M. P.M.	Tool Closed	7:22 A.M. P.M.

Mea. From Tester Valve

Remarks Opened tool for 20 minute 1st flow. Closed tool for 45 minute initial closed in pressure. Reopened tool for 60 minute 2nd flow with gas to surface in 8 minutes at 84 MCF. Increased to 134 MCF throughout test. Closed tool for 45 minute final closed in pressure.

Legal Location Sec. - Twp. - Rng.: SEC. 23 - 25S - 8W NW/NE/NE

Field Area: ---

County: RENO

State: KANSAS

Lease Name: KREHBIEL

Well No.: 2

Test No.: 2

Lease Owner/Company Name: E. H. RIGGS

Owner's District: KANSAS

Sec. 23

FORMATION TEST DATA

5

Gauge No. 526	Depth 3758'	Clock 12 hour	Ticket No. 423422

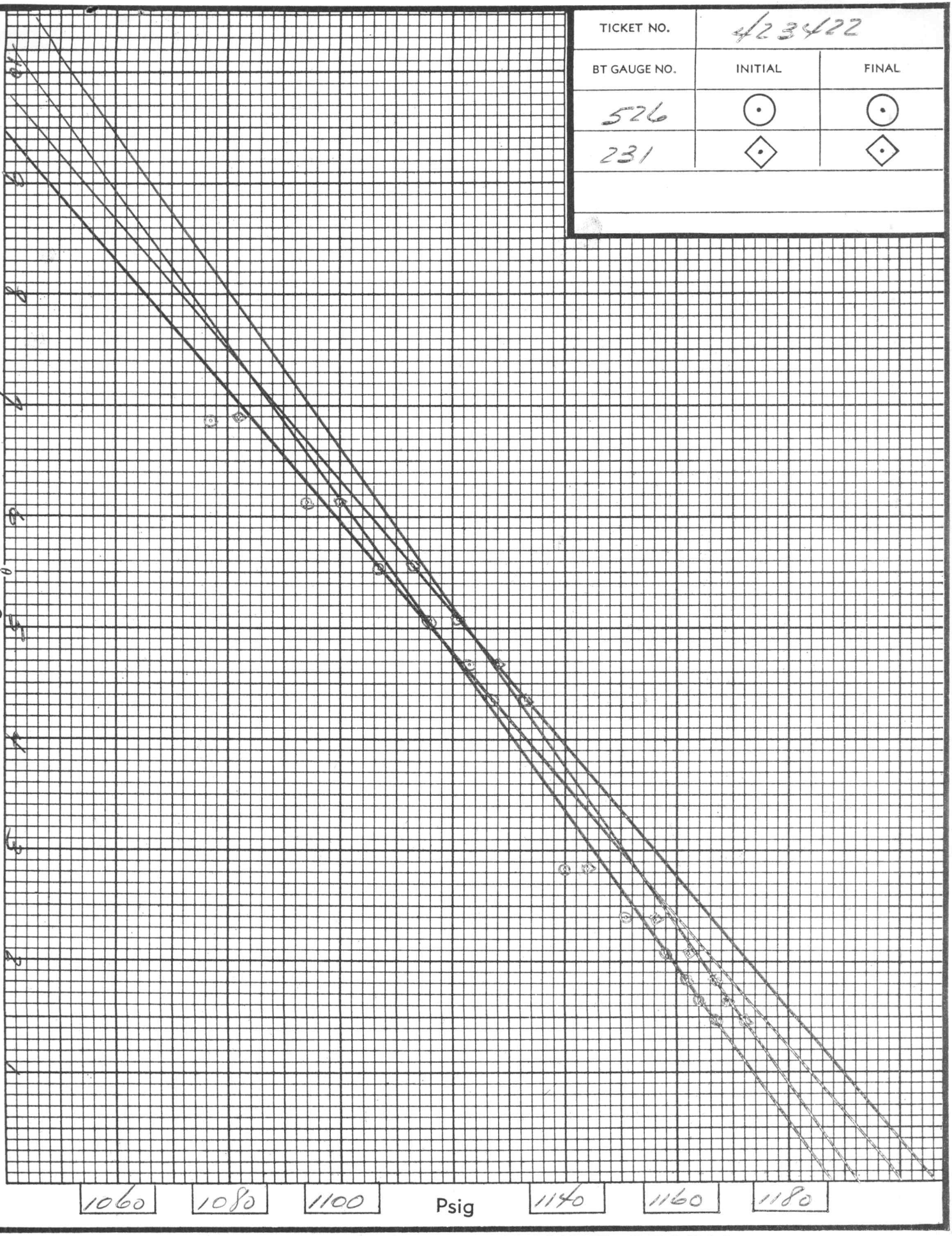
	First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
P_0	.000	36	.000	----	34	.000	38	.000	----	37
P_1	.0315	27	.034	.672	838	.1008	30	.0341	1.217	816
P_2	.0630	30	.068	.455	1052	.2016	69	.0682	.942	989
P_3	.0945	32	.102	.349	1115	.3024	35	.1023	.790	1048
P_4	.1260	34	.136	.284	1140	.4030	37	.1364	.688	1077
P_5			.170	.240	1151			.1705	.613	1094
P_6			.204	.208	1158			.2046	.554	1107
P_7			.238	.184	1162			.2387	.507	1116
P_8			.272	.165	1164			.2728	.468	1123
P_9			.306	.149	1167			.3070	.435	1127
P_{10}										

Gauge No. 231	Depth 3765'	Clock 12 hour
P_0	.000	45	.000	----	44	.000	44	.000	----	42
---	---	---	---	---	---	---	---	---	---	---
P_1	.032	36	.0347	.671	800	.1018	34	.0343	1.220	803
P_2	.064	39	.0694	.453	1043	.2036	74	.0686	.944	991
P_3	.096	42	.1041	.348	1118	.3054	41	.1029	.792	1054
P_4	.128	44	.1388	.283	1144	.4070	42	.1372	.690	1082
P_5			.1735	.239	1156			.1715	.614	1100
P_6			.2082	.208	1162			.2058	.556	1113
P_7			.2429	.183	1167			.2401	.508	1121
P_8			.2776	.164	1169			.2744	.469	1128
P_9			.3120	.149	1172			.3090	.436	1133
P_{10}										
Reading Interval	5		5			15		5		Minutes

REMARKS:

SPECIAL PRESSURE DATA

TICKET NO.	423422	
BT GAUGE NO.	INITIAL	FINAL
526	⊙	⊙
231	◇	◇



EXTRAPOLATED PRESSURE GRAPH

Gas Production

B.T. Gauge Numbers			526	231	Ticket Number	123422
			PRESSURE	PRESSURE		
Initial Hydrostatic			2051	2059	Elevation	1565 ft.
Final Hydrostatic			2040	2047	Production Rate — Intial	84 m cu. ft.
		Time			Production Rate — Final	134 m cu. ft.
1st Flow	Initial	— — — —	36	45		
	Final	20	34	44	Hole Size	9 in.
Initial Closed In Pressure		45	1167	1172	Footage Tested	9 NET ft.
2nd Flow	Initial	— — — —	38	44	Mud Weight	10.3 lbs. gal.
	Final	60	37	42	Gas Viscosity	0.015 cp
Final Closed In Pressure		45	1127	1133	Gas Gravity	0.65 EST. —
Extrapolated Static Pressure	Initial		1188	1192	Gas Compressibility	0.85 —
	Final		1200	1206		
Slope ~~Psi²/cycle~~ P10	Initial		1042	1052		
	Final		1032	1038		

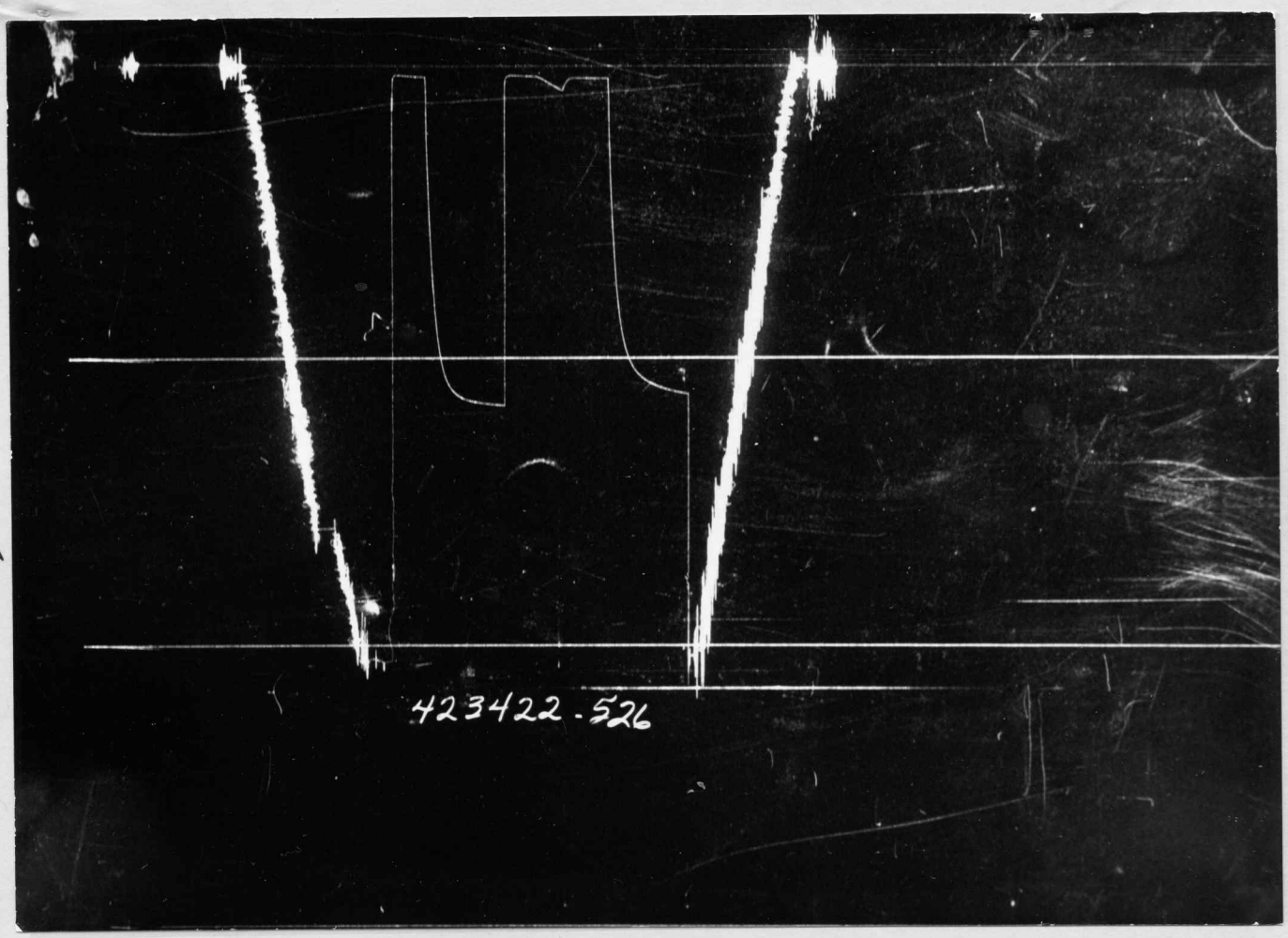
Remarks:

SUMMARY

Product	Equation	BT Gauge Number Depth 526/3758' Initial	Final	BT Gauge Number Depth 231/3765' Initial	Final	Units
Transmissability	$\frac{Kh}{\mu} = \frac{1637\ Q_g\ ZT}{m}$	203.6	281.9	210.9	280.4	md. ft. / cp
Theoretical Flow Capacity	$Kh = \frac{Kh}{\mu}\ \mu$	3.1	4.2	3.2	4.2	md. ft.
Average Effective	$K = \frac{Kh}{h}$	—	—	—	—	md.
Permeability	$K_1 = \frac{Kh}{h_1}$	0.3	0.5	0.4	0.5	md.
Indicated Flow Capacity	$(Kh)_s = \frac{3200\ Q_g\ \mu\ ZT\ \mathrm{Log}(0.472\ b/r_w)}{P_s^2 - P_y^2}$	0.8	2.0	0.8	2.0	md. ft.
Damage Ratio	$DR = \frac{\text{Theo. Flow Cap}}{\text{Indicated Flow Cap}}\ \frac{Kh}{(Kh)_s}$	3.8	2.1	3.9	2.1	—
Indicated Flow Rate	$OF_1 = \frac{Q_g\ \ P_s^2}{P_s^2 - P_y^2}$ Max.	84.1	134.1	84.1	134.2	MCFD
	$OF_2 = \frac{Q_g\ \ P_s}{\sqrt{P_s^2 - P_y^2}}$ Min.	84.0	134.1	84.1	134.1	MCFD
Theoretical Potential Rate	$OF_3 = OF_1\ DR$ Max.	317.8	282.3	327.7	283.9	MCFD
	$OF_4 = OF_2\ DR$ Min.	317.6	282.2	327.5	283.8	MCFD
Approx. Radius of Investigation	$b \cong \sqrt{Kt}$ or $\sqrt{Kt_0}$	—	—	—	—	ft.
	$b_1 \cong \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$	3.0	6.5	3.1	6.5	ft.
Potentiometric Surface *	$Pot. = (El - GD) + (2.319\ Ps)$	561.9	589.8	564.2	596.7	ft.

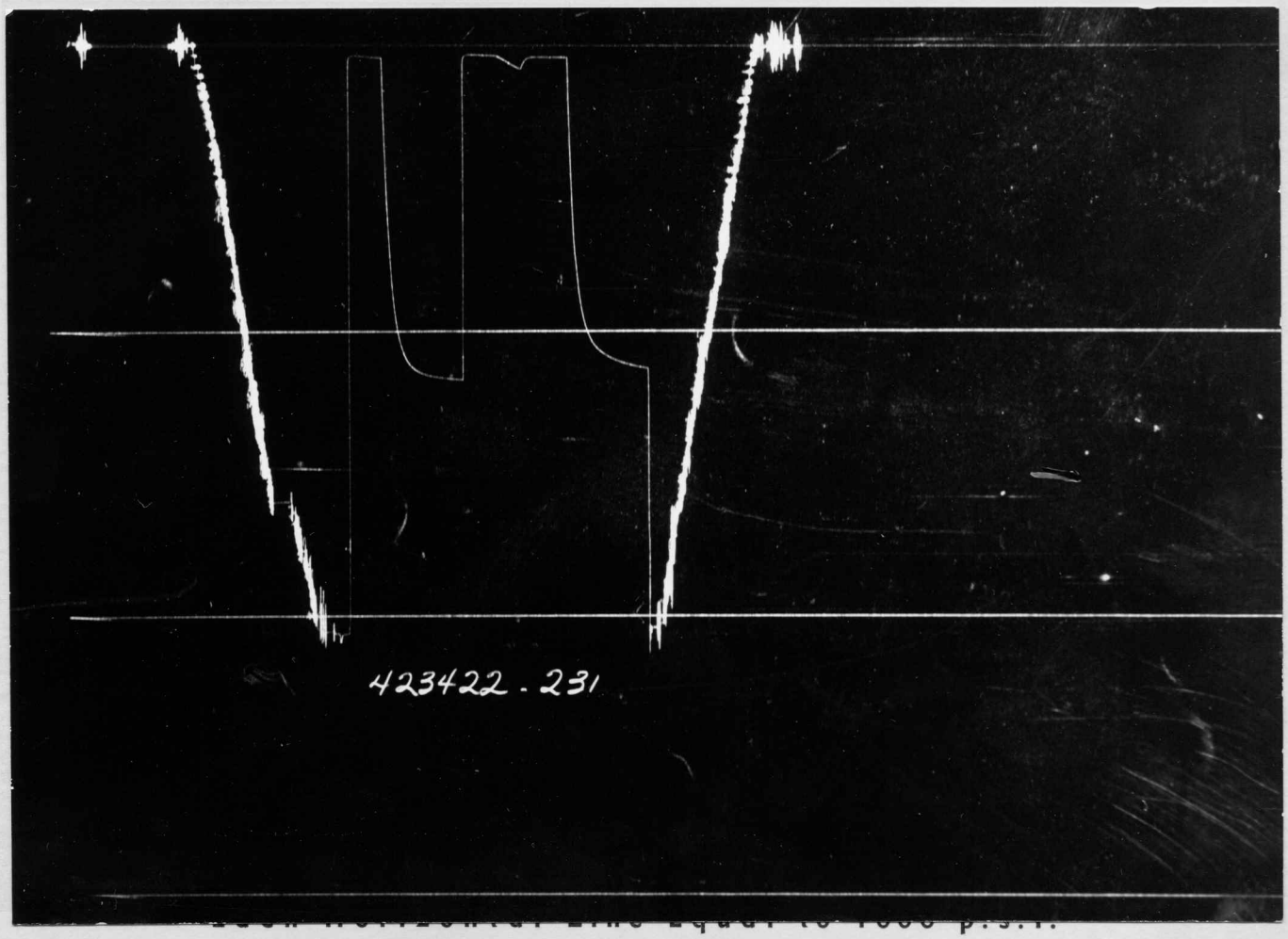
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INTERPRETATIONS AND CALCULATIONS



PRESSURE

TIME



Each horizontal line equal to 1000 p.s.i.