

Flow Time	1st 30 Min.	2nd 60 Min.	Date	6-2-67	Ticket Number	468330 - S
Closed In Press. Time	1st 30 Min.	2nd 30 Min.	Kind of Job	OPEN HOLE	Halliburton District	HAYS
Pressure Readings	Field	Office Corrected	Tester	HUGHES	Witness	DOUGLASS
Depth Top Gauge	Ft.	Blanked Off	Drilling Contractor	ABERCROMBIE DRILLING, INC.		
BT. P.R.D. No.		Hour Clock	Elevation	-	Top Packer	3211'
Initial Hydro Mud Pressure			Total Depth	3228'	Bottom Packer	3216'
Initial Closed in Pres.			Interval Tested	3216' - 3228'	Formation Tested	TOPEKA
Initial Flow Pres.	1		Casing or Hole Size	6 1/2"	Casing Perfs.	Top - Bot. -
Final Flow Pres.	1		Surface Choke	1/2"	Bottom Choke	3/4"
Final Closed in Pres.			Size & Kind Drill Pipe	3 1/2" I.F.	Drill Collars Above Tester	I.D. - LENGTH FLEX WEIGHT-992'
Final Hydro Mud Pressure			Mud Weight	10	Mud Viscosity	DRILL COLLARS 78' 40
Depth Cen. Gauge	Ft.	Blanked Off	Temperature	90	Anchor Size & Length	ID 3.76" OD 5" X 12'
BT. P.R.D. No.		Hour Clock	Depths Mea. From	KELLY BUSHING	Depth of Tester Valve	3198' Ft.
Initial Hydro Mud Pres.			Cushion	NONE	Depth Back Pres. Valve	NONE Ft.
Initial Closed in Pres.			Recovered	60'	Feet of mud	
Initial Flow Pres.	1		Recovered	60'	Feet of muddy water	
Final Flow Pres.	1		Recovered		Feet of	
Final Closed in Pres.			Recovered		Feet of	
Final Hydro Mud Pres.			Oil A.P.I. Gravity		Water Spec. Gravity	
Depth Bot. Gauge	322 Ft.	Blanked YES Off	Gas Gravity		Surface Pressure	psi
BT. P.R.D. No.	294	Hour 12 Clock	Tool Opened	9:45 AM	Tool Closed	12:15 PM
Initial Hydro Mud Pres.	1897	1785	Remarks	Tool opened @ 9:45 AM with a very weak		
Initial Closed in Pres.	1099	1096	blow for a 30 minute first flow. Rotated tool for			
Initial Flow Pres.	18 1	18	a 30 minute initial closed in pressure. Tool re-			
Final Flow Pres.	36 2	48	opened for a 60 minute second flow period with a ver			
Final Closed in Pres.	90 1	35	weak blow throughout the test. Took a 30 minute fin			
Final Hydro Mud Pres.	72 2	77	closed in pressure.			

2-105-507-196w

Legal Location: 2 - 16 - 19
 Lease Name: ZIMMERMAN
 Well No.: 1
 Test No.: 1
 Field Area: ABERCROMBIE DRILLING, INC.
 Lease Owner/Company Name: ABERCROMBIE DRILLING, INC.
 County: RUSH
 State: KANSAS
 Owner's District: WICHITA, KANSAS

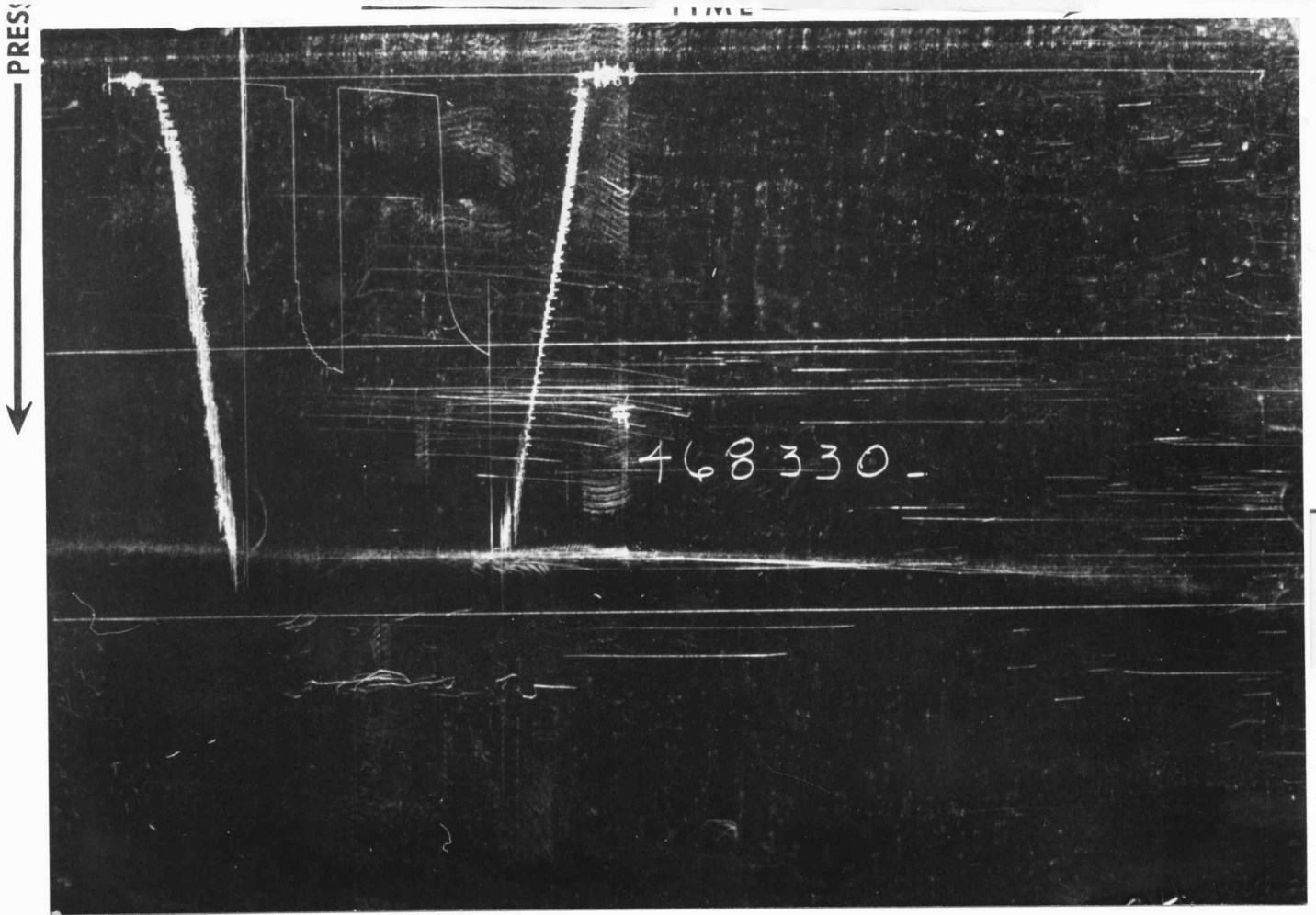
FORMATION TEST DATA

Gauge No.		Depth			Clock		Ticket No. 468330		
First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure		
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\oplus}{\ominus}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\oplus}{\ominus}$	PSIG Temp. Corr.
P ₀									
P ₁									
P ₂									
P ₃									
P ₄									
P ₅									
P ₆									
P ₇									
P ₈									
P ₉									
P ₁₀									

Gauge No. 294		Depth 3225'			Clock 12 hour				
P ₀	.000	18	.000	35	.000	48	.000	77	
P ₁	.0287	22	.0214	84	.100	50	.0193	649	
P ₂	.0574	24	.0428	873	.200	58	.0386	844	
P ₃	.0861	26	.0642	944	.300	67	.0579	907	
P ₄	.1148	29	.0856	990	.400	77	.0772	943	
P ₅	.1435	33	.1070	1024			.0965	966	
P ₆	.172	35	.1284	1048			.1158	988	
P ₇			.1498	1061			.1351	1003	
P ₈			.1712	1080			.1544	1015	
P ₉			.1926	1086			.1737	1027	
P ₁₀			.214	1096			.193	1036	
Reading Interval 5		3			15		3 Minutes		

REMARKS:

SPECIAL PRESSURE DATA



Each Horizontal Line Equal to 1000 p.s.i.

Flow Time	1st Min.	2nd Min.	Date	Ticket Number	Legal Location
30	30	6-3-67	468331 - S	Sec. - Twp. - Rng.	
Closed In Press. Time	1st Min.	2nd Min.	Kind of Job	Halliburton District	Lease Name
30	30	OPEN HOLE	HAYS	ZIMMERMAN	
Pressure Readings	Field	Office Corrected	Tester	Witness	Well No.
			MR. HUGHES	MR. DOUGLASS	2
Depth Top Gauge	Ft.	Blanked Off	Drilling Contractor	IC	Field Area
			ABERCROMBIE DRILLING INCORPORATED		
BT. P.R.D. No.	Hour Clock	Elevation	Top Packer	3328'	County
					RUSH
Initial Hydro Mud Pressure	Total Depth	3372'	Bottom Packer	3333'	State
					KANSAS
Initial Closed in Pres.	Interval Tested	3333' - 3372'	Formation Tested	LOWER KANSAS CITY	Owner's District
					WICHITA
Initial Flow Pres.	1	Casing or Hole Size	6 1/4"	Casing Perfs. } Top	Test No.
	2			Bot.	
Final Flow Pres.	1	Surface Choke	1/4"	Bottom Choke	992' D. FLEX WT.
	2			3/4"	78' D.C.
Final Closed in Pres.	Size & Kind Drill Pipe	3 1/2" I.F.	Drill Collars Above Tester	78' D.C.	2
Final Hydro Mud Pressure	Mud Weight	10.2	Mud Viscosity	40	2
Depth Cen. Gauge	Ft.	Blanked Off	Temperature	91 °F Est.	Anchor Size & Length
				°F Actual <td>ID 3.76" X 39'</td>	ID 3.76" X 39'
BT. P.R.D. No.	Hour Clock	Depths Mea. From	KELLY BUSHINGS	Depth of Tester Valve	3315' Ft.
Initial Hydro Mud Pres.	TYPE	AMOUNT	Cushion	-	Depth Back Pres. Valve
Initial Closed in Pres.	Recovered	120	Feet of Muddy water		Mea. From Tester Valve
Initial Flow Pres.	1	Recovered	Feet of		County
	2				RUSH
Final Flow Pres.	1	Recovered	Feet of		State
	2				KANSAS
Final Closed in Pres.	Recovered	Feet of			Owner's District
					WICHITA
Final Hydro Mud Pres.	Oil A.P.I. Gravity	-	Water Spec. Gravity	-	9
Depth Bot. Gauge	3369 Ft.	Blanked Off	Gas Gravity	-	Surface Pressure
		YES			psi
BT. P.R.D. No.	294	Hour Clock	12	Tool Opened	1:20 PM A.M. P.M.
Initial Hydro Mud Pres.	1988	1843	Remarks	Opened tool for 30 minute 1st flow with a	
Initial Closed in Pres.	793	784	weak blow increasing to fair. Closed tool for 30		
Initial Flow Pres.	36	1	33	minute initial closed in pressure. Reopened tool	
	72 <td>2</td> <td>71</td> <td colspan="2"></td>	2	71		
Final Flow Pres.	72	1	64	for 30 minute 2nd flow with no blow; flushed tool	
	79 <td>2</td> <td>86</td> <td colspan="2"></td>	2	86		
Final Closed in Pres.	631	637	and reopened with no blow. Closed tool for 30		
Final Hydro Mud Pres.	1951	1843	minute final closed in pressure.		

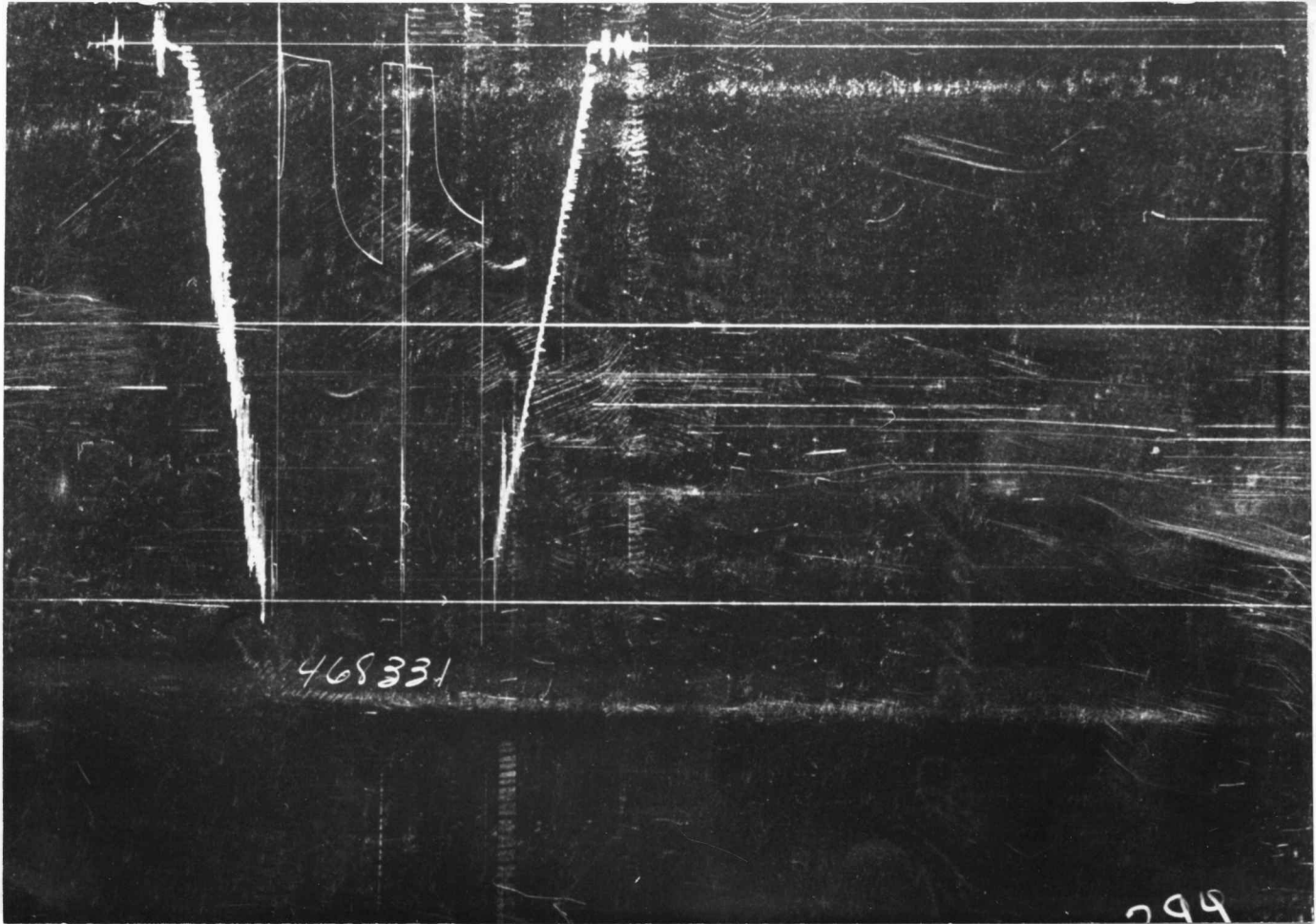
FORMATION TEST DATA

Gauge No.		Depth			Clock		Ticket No. 468331		
First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure		
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \ominus}{\ominus}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \ominus}{\ominus}$	PSIG Temp. Corr.
P ₀									
P ₁									
P ₂									
P ₃									
P ₄									
P ₅									
P ₆									
P ₇									
P ₈									
P ₉									
P ₁₀									

Gauge No.	294		Depth	3369'		Clock	12		hour
P ₀	.000	33	.000		64	.000	71	.000	86
P ₁	.0396	42	.021		471	.0384	71	.020	417
P ₂	.0792	49	.042		588	.0768	75	.040	495
P ₃	.1188	55	.063		645	.1152	80	.060	530
P ₄	.1584	61	.084		682	.1536	82	.080	556
P ₅	.1980	64	.105		709	.1920	86	.100	576
P ₆			.126		731			.120	593
P ₇			.147		747			.140	606
P ₈			.168		760			.160	618
P ₉			.189		774			.180	628
P ₁₀			.210		784			.200	637
Reading Interval	6		3		6		3		Minutes
REMARKS:									

SPECIAL PRESSURE DATA

PRE
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Each Horizontal Line Equal to 1000 p.s.i.

ZIMMERMAN
 1
 3
 ABERCROMBIE DRILLING, INCORPORATED
 WICHITA, KANSAS

Legal Location Sec. - Twp. - Rng. 2 - 16 - 19
 Lease Name
 Well No.
 Test No.
 Field Area
 Country
 RUSH
 State
 KANSAS

Flow Time	1st Min. 30	2nd Min. 30	Date	6-5-67	Ticket Number	468332 - S
Closed in Press. Time	1st Min. 30	2nd Min. 30	Kind of Job	OPEN HOLE	Halliburton District	HAYS, KANSAS
Pressure Readings	Field	Office Corrected	Tester	HUGHES	Witness	DOUGLASS
Depth Top Gauge	Ft.	Blanked Off	Drilling Contractor	ABERCROMBIE DRILLING, INCORPORATED		
BT. P.R.D. No.		Hour Clock	Elevation	-	Top Packer	3597'
Initial Hydro Mud Pressure			Total Depth	3610'	Bottom Packer	3602'
Initial Closed in Pres.			Interval Tested	(NET PAY 2') 3602' - 3610'	Formation Tested	ARBUCKLE
Initial Flow Pres.	1		Casing or Hole Size	6 1/4"	Casing Perfs. } Top	-
	2				Casing Perfs. } Bot.	-
Final Flow Pres.	1		Surface Choke	1/4"	Bottom Choke	3/4"
	2					
Final Closed in Pres.			Size & Kind Drill Pipe	3 1/2" I.F.	Drill Collars Above Tester	I.D. - LENGTH 375' ID FLEX WEIGHT 992' ID
Final Hydro Mud Pressure			Mud Weight	10.3	Mud Viscosity	78' D.C. - 2 1/2" ID 36
Depth Cen. Gauge	Ft.	Blanked Off	Temperature	104	Anchor Size & Length	3.76" ID 5" OD X 8'
BT. P.R.D. No.		Hour Clock	Depths Mea. From	KELLY BUSHING	Depth of Tester Valve	3574' Ft.
Initial Hydro Mud Pres.			Cushion	NONE	Depth Back Pres. Valve	NONE Ft.
Initial Closed in Pres.			Recovered	270' Feet of	gassy oil	Meas. From Tester Valve
Initial Flow Pres.	1					
	2		Recovered	120' Feet of	mud cut oil	
Final Flow Pres.	1					
Final Flow Pres.	2		Recovered	184' Feet of	gas	
Final Closed in Pres.			Recovered		Feet of	
Final Hydro Mud Pres.			Oil A.P.I. Gravity	40.5°@ 60°	Water Spec. Gravity	-
Depth Bot. Gauge	3607 Ft.	Blanked YES Off	Gas Gravity	-	Surface Pressure	0# psi
BT. P.R.D. No.	294	Hour Clock 12	Tool Opened	2:15 PM	A.M. P.M. Tool Closed	4:15 A.M. P.M.
Initial Hydro Mud Pres.	2079	1968	Remarks	Tool opened @ 2:15 PM for a 30 minute		
Initial Closed in Pres.	847	845	first flow with a fair blow increasing to a strong			
Initial Flow Pres.	18	1	40	blow in 7 minutes. Rotated tool for a 30 minute		
	108	2	116	initial closed in pressure. Tool reopened with a		
Final Flow Pres.	90	1	101	strong blow, which continued throughout the test.		
	144	2	156			
Final Closed in Pres.	703	701				
Final Hydro Mud Pres.	-	1942	Took a 30 minute final closed in pressure.			





FORMATION TEST DATA

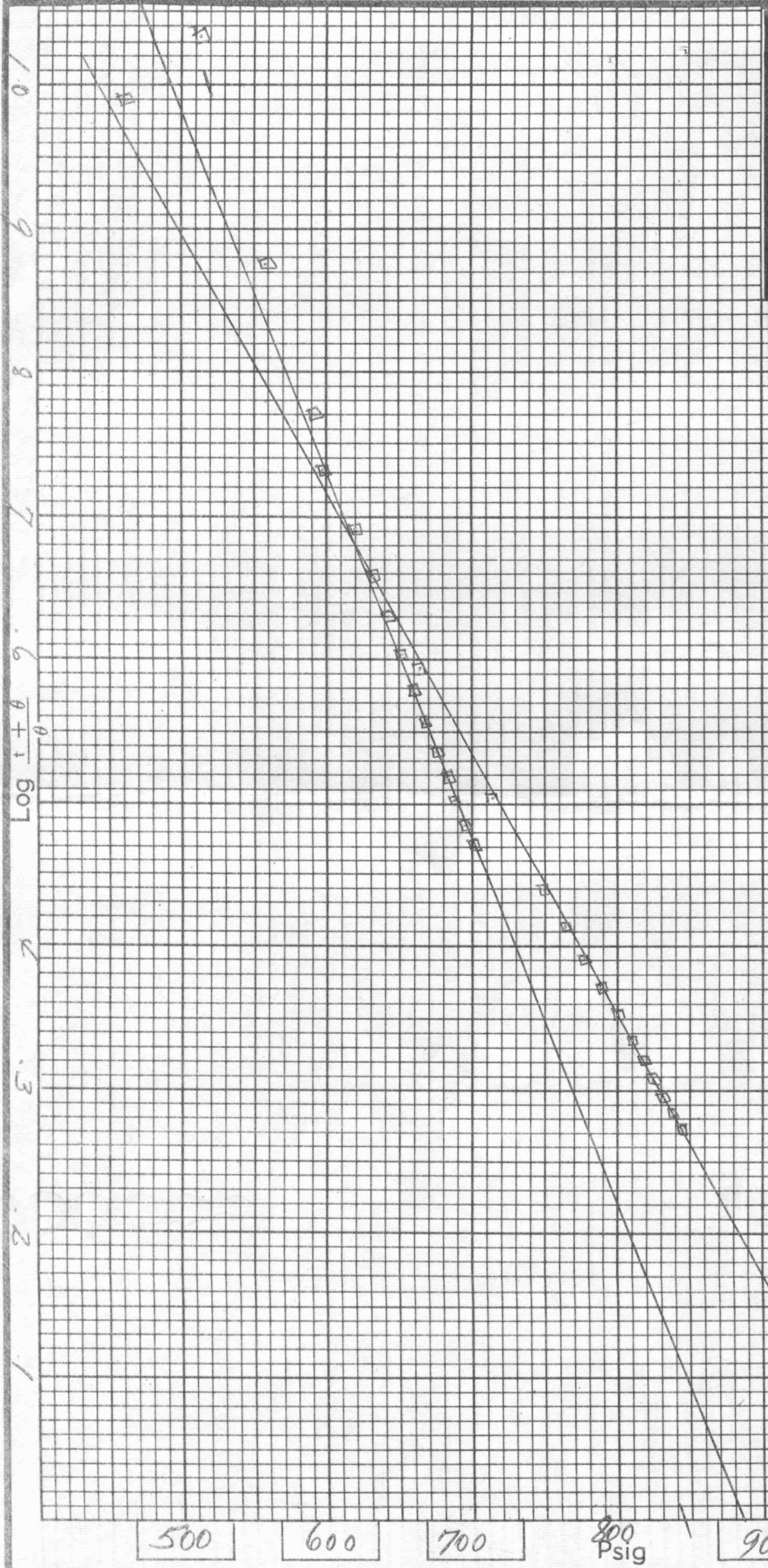
Gauge No.		Depth			Clock		hour		Ticket No. 468332	
First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\phi}{\phi}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\phi}{\phi}$	PSIG Temp. Corr.	
P ₀										
P ₁										
P ₂										
P ₃										
P ₄										
P ₅										
P ₆										
P ₇										
P ₈										
P ₉										
P ₁₀										

Gauge No. 294		Depth 3607'			Clock 12		hour			
P ₀	.000	40	.000	-----	101	.000	116	.000	-----	156
P ₁	.0313	47	.0214	.990	462	.0333	119	.0198	1.313	437
P ₂	.0626	61	.0428	.731	598	.0666	128	.0396	1.033	513
P ₃	.0939	74	.0642	.594	664	.0999	135	.0594	.876	559
P ₄	.1252	83	.0856	.504	715	.1332	144	.0792	.770	593
P ₅	.1565	93	.1070	.440	749	.1665	148	.0990	.691	620
P ₆	.188	101	.1177	.414	763	.200	156	.1089	.659	632
			.1284	.391	777			.1188	.630	643
P ₇			.1391	.371	789			.1287	.603	651
			.1498	.353	800			.1386	.579	660
			.1605	.336	810			.1485	.557	668
P ₈			.1712	.321	818			.1584	.537	676
			.1819	.308	825			.1683	.519	683
P ₉			.1926	.295	832			.1782	.502	689
			.2033	.284	838			.1881	.486	696
P ₁₀			.214	.273	845			.198	.471	701
Reading Interval 5		3			5		3			Minutes

REMARKS:

SPECIAL PRESSURE DATA

TICKET NO.	468332	
BT GAUGE NO.	INITIAL	FINAL
—		
294		



EXTRAPOLATED PRESSURE GRAPH

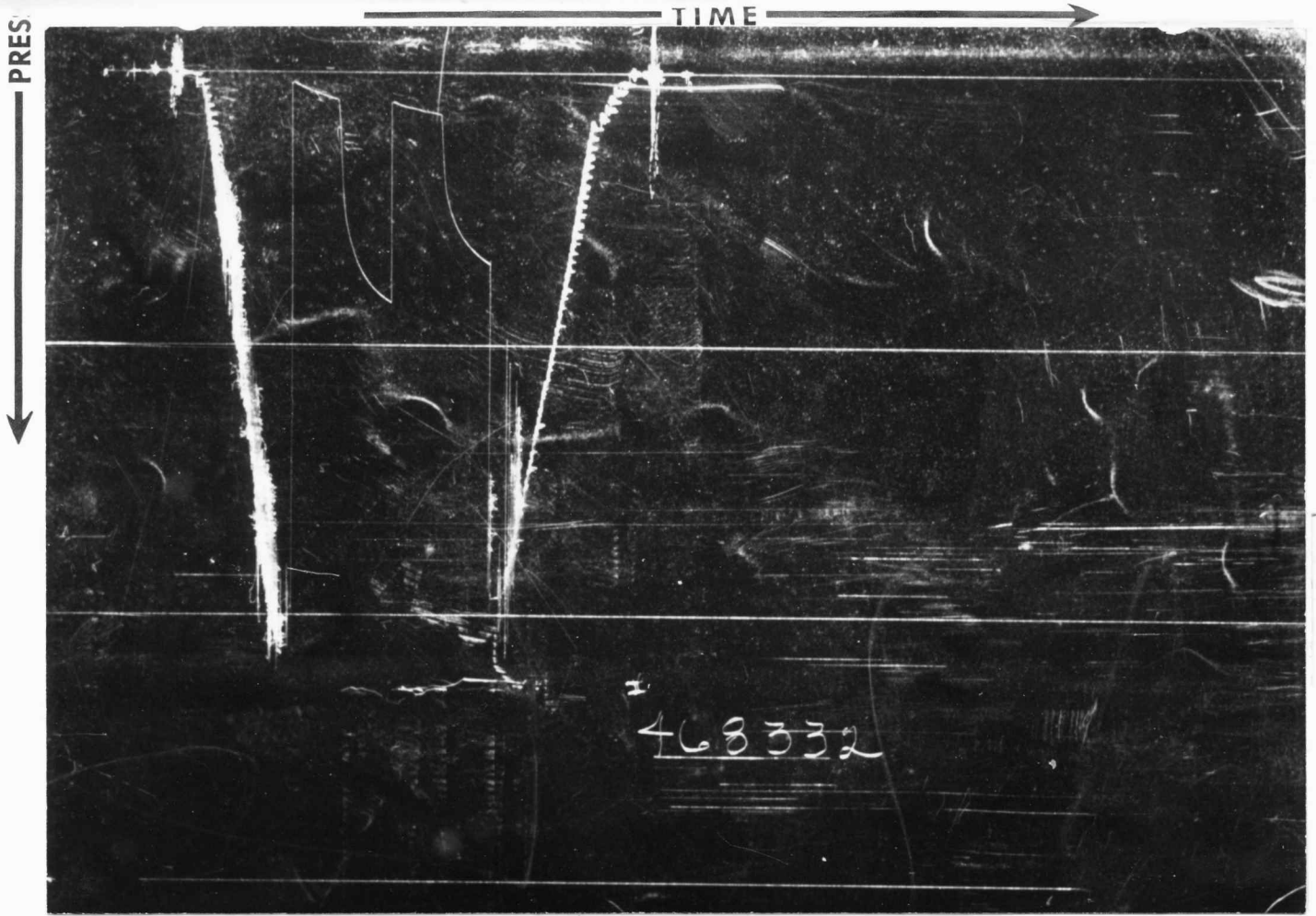
Liquid Production

B.T. Gauge Numbers			294	Ticket Number		468332
Initial Hydrostatic		PRESSURE	PRESSURE	Elevation		0 ft.
			1968			
Final Hydrostatic			1942	1st Flow		64.8 bbls. day
1st Flow	Initial	Time	40	Indicated Production		44.4 bbls. day
	Final	-----		Total Flow		
		30	101	Drill Collar Length		78 ft.
Initial Closed In Pressure		30	845	Drill Collar I.D.		2 1/4" in.
2nd Flow	Initial	-----	116	Drill Pipe Factor		0.00742 bbls. ft.
	Final	30	156	Hole Size		6 1/2" in.
Final Closed In Pressure		30	701	Footage Tested		2' ft.
Extrapolated Static Pressure		Initial	994	Mud Weight		10.3 lbs. gal.
		Final	886	Viscosity, Oil or Water		3.0 cp
Slope psi/cycle P-10		Initial	442	Oil API Gravity		40.5°
		Final	492	Water Specific Gravity		-

Remarks: Possible depletion may be indicated in view of the pressure drop between initial closed in pressure and final closed in pressure and production loss between initial flow and final flow.

SUMMARY		Gauge No. Depth	294 / 3607'			
Product	Equation	Initial	Final	Initial	Final	Units
Production	$Q = \frac{1440 R}{t}$			64.8	44.4	bbls. day
Transmissibility	$\frac{Kh}{\mu} = \frac{162.6 Q}{m}$			19.0	18.3	md. ft. / cp
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu} \mu$			57.2	54.9	md. ft.
Average Effective	$K = \frac{Kh}{h}$			-	-	md.
Permeability	$K_1 = \frac{Kh}{h_1}$			28.260	27.474	md.
Damage Ratio	$DR = .183 \frac{P_s - P_f}{m}$			0.30	0.33	—
Theoretical Potential w/Damage Removed	$Q_1 = Q DR$			64.8	44.4	bbls. day
Approx. Radius of Investigation	$b \approx \sqrt{Kt}$ or $\sqrt{Kt_0}$			-	-	ft.
	$b_1 \approx \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$			29.3	40.6	ft.
Potentiometric Surface *	Pot. = EI - GD + 2.319 Ps			-1301.9	-1552.4	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.



Each Horizontal Line Equal to 1000 p.s.i.