

PHILLIPS PETROLEUM COMPANY
WELL PRODUCTION TEST

Well: 7/11-~~2~~x

DST No. 2

Interval: 9932' to 10,190'

Date of test: October 2 through October 4, 1968

Hole size: 9 7/8" casing set at 10,510' RKB with a
Baker Model "K" cement retainer set at
10,352' RKB.

Test string make-up

<u>Item</u>	<u>I.D.</u>	<u>O.D.</u>	<u>Lgth</u>	<u>RKB Setting Depth</u>
BJ Bull Nose Plug	2.75"	4.75	2.50	10147.37
BJ Recorder Case	2.75	4.75	4.00	10144.87
BJ Perforated Sub	2.50	4.75	1.00	10140.87
BJ Hanger Sub	2.25	4.75	1.00	10139.87
BJ Recorder Case	2.75	4.75	4.00	10138.87
BJ Hanger Sub	2.25	4.75	1.00	10134.87
Cross Over Sub	2.50	4.75	1.64	10133.87
TBG for Leutert Recorder	2.99	3.50	31.33	10132.32
Baker Hanger Sub	2.50	4.50	0.88	10100.90
Perforated Tubing	2.99	3.50	31.60	10100.02
3½" tubing	2.99	3.50	186.50	10068.42
BJ FFC Packer	3.00	8.22	10.00	9881.92
Cross over Sub	2.32	4.75	0.82	9871.92
Drill Collars	2.25	6.50	278.97	9871.10
Cross over Sub	2.50	6.00	0.85	9592.38
Pressure Balanced Bumper Sub	2.00	5.00	21.78	9591.28
Cross over Sub	2.25	4.75	1.05	9569.50
3½" 9.3 lb N-80 tbg	2.99	3.50	9228.45	9568.45
Otis Test Tree	2.50	13.38	24.25	340.00
Cross over Sub	2.25	3.50	0.20	315.75
3½" tbg	2.99	2.99	326.00	315.55
Hydril Valve	3.00			(10.45)
Baker Test Head	3.00			

Depth of Pressure Recorder:

Bottom BJ Recorder - 10140'
Top BJ Recorder - 10135'
Leutert Recorder - 10112'

The following are attached to this report:

1. Test Summary
2. Wellhead pressure measurements and flow rate calculations.
It should be noted that all flow rate calculations were based on an assumed gas gravity of 0.68 for separated gas and 0.79 for mixed distillate and gas.
3. AOF curve
4. Dimensionless time versus Pressure plot.



PHILLIPS PETROLEUM COMPANY

TEST STARTED: 2352 HRS Oct. 2, 1968

TEST COMPLETED: 1602 HRS Oct. 4, 1968

DST NO. 2 SUMMARY

DEPTH OF PRESSURE RECORDER: Bottom BJ - 10140'; Top BJ - 10135'; Leutert - 10112'

Operation	Time		Length of Test		Choke Size	Wellhead		Gas MMCFD	Oil BPD	GOR Cu.Ft./STB	Water BPD	BHP PSIA Top B-J
	From	To	Hrs.	Mins.		Press PSIA	Temp °F					
I.F.	2352	2357	05		1"	0	N.R.	None	2976	None	None	4009
I.S.I.	2357	0605	6	08	None	1470	62	None	None	None	None	5661
Unload tubing	0605	0623		18	1"	265	87	None	6394	None	None	4250
Flow-vent	0623	1205	5	42	2-1½"	528	128	43.18	N.R.	N.R.	N.R.	3666
Shut-in	1205	1718	5	13	None	3839	60	None	None	None	None	5566
Repair leak	1718	1753		35	None	3820	60	None	None	None	None	Various
Flow-sep	1753	2000	2	07	1/4" /	3632	87	3.54	504	7024	None	5356
Shut-in H-1	2000	2200	2	00	None	3811	58	None	None	None	None	5575
Flow-sep (H-K)	2200	2400	2	00	27/64"	3293	116	9.36 /	1043	8950	None	4976
Shut-in (K-L)	000	0200	2	00	None	3864	55	None	None	None	None	5571
Flow-sep (L-M)	0200	0400	2	00	3/4"	2695	144	16.55 /	1390	11,900	None	4531
Shut-in (M-N)	0400	0600	2	00	None	3880	58	None	None	None	None	5566
Flow-sep (N-O)	0600	0800	2	00	1"	2269	160	22.13	1267	17,466	None	4274
Flow-sep	0800	0830		30	1"	2275	164	21.16	1254	16,874	None	4282
Flow-sep	0830	1003	1	33	28/64"	3252	154	10.99	1149	9,564	None	4914
Flow-sep	1003	1312	3	09	1/4"	N.R.	N.R.	4.52	490	9,224	None	5306
Shut-in	1312	1602	2	50	None	N.R.	N.R.	None	None	None	None	5571

DATE: Oct. 2, 1968**PHILLIPS PETROLEUM CO.**LEASE: 7/11

SURFACE PRESSURE

INTERVAL: 9932'-10190'WELL NO.: 7/11-2TEST NO.: 2

TIME	WELLHEAD		REMARKS
	TEMP °F	PRESS PSIG	
2352	N.R.	0	Opened well for IF - Rate - 2bpm
2357	N.R.	0	Shut-in for ISI - (Total Recovery - 10 bbls)
2358	N.R.	1000	Pressure gauge reading
0000	N.R.	1380	Dead weight tester reading
0015	N.R.	1422	
0030	N.R.	1427	
0045	N.R.	1431	
0100	N.R.	1435	
0115	N.R.	1437	
0130	N.R.	1440	
0145	N.R.	1440	
0200	60	1442	
0215	N.R.	1444	
0230	N.R.	1445	
0245	N.R.	1447	
0300	N.R.	1447	
0315	N.R.	1447	
0330	N.R.	1447	
0345	N.R.	1448	
0400	N.R.	1448	
0415	N.R.	1449	
0430	N.R.	1450	
0445	N.R.	1450	
0500	N.R.	1450	
0515	N.R.	1449	
0530	60	1450	

WELL NO.: 7/11-2



PHILLIPS PETROLEUM CO.

CALCULATION OF GAS DELIVERY RATES
($Q = C \times Pnw \times Ftf \times Fg$)

PAGE 3 OF

INTERVAL:

TIME	Wellhead Pressure psig	Wellhead Temperature °F	Choke Size	Choke No.	Choke Pressure psia	Choke Co-efficient	Ftf	Fg	Q	Q
									per choke	total
0605										
		Opened well for final flow								
0620	145	87	1"	clean up	N.R.					
0622	250	N.R.	1"	clean up	N.R.					
0623		Gas to surface								
0624	850	N.R.	1"	clean up	N.R.					
0625	1230	107	1"	clean up	N.R.					
0630	1100	107	1"	clean up	N.R.					
0635	500	107	1½"	P	N.R.					
	500	107	1"	clean up	N.R.					
0636	400	107	1½"	P	N.R.					
		107	1½"	S	N.R.					
0640	N.R.	100	1½"	P	365	62.15	0.9715	0.872	19.22	
			1½"	S	369	62.15	0.9715	0.872	19.43	38.65 ✓
0645	455	105	1½"	P	375	62.15	0.9715	0.872	19.74	
			1½"	S	377	62.15	0.9715	0.872	19.85	39.59
0700	472	104	1½"	P	390	62.15	0.9715	0.872	20.53	
			1½"	S	387	62.15	0.9715	0.872	20.38	41.11 ✓
0715	482	104	1½"	P	396	62.15	0.9715	0.872	20.85	
			1½"	S	395	62.15	0.9715	0.872	20.80	41.65
0730	486	107	1½"	P	392	62.15	0.9662	0.872	20.53	
			1½"	S	402	62.15	0.9662	0.872	21.05	41.58
0745	491	109	1½"	P	402	62.15	0.9636	0.872	20.99	
			1½"	S	402	62.15	0.9636	0.872	20.99	41.98
0800	495	112	1½"	P	406	62.15	0.9602	0.872	21.11	
			1½"	S	405	62.15	0.9602	0.872	21.08	42.19 ✓



PHILLIPS PETROLEUM CO.

CALCULATION OF GAS DELIVERY RATES
($Q = C \times P_{nw} \times F_{tf} \times F_g$)

PAGE 4 OF

WELL NO.:

INTERVAL:

TIME	Wellhead Pressure psig	Wellhead Temperature °F	Choke Size	Choke No.	Choke Pressure psia	Choke Co-efficient	F _{tf}	F _g	Q	Q
									per choke	total
0815	497	114	1½"	P	407	62.15	0.9592	0.872	21.16	
			1½"	S	407	"	0.9592	"	21.16	42.32
0830	498	114	1½"	P	407	"	0.9592	"	21.15	
			1½"	S	409	"	0.9592	"	21.26	42.41
0845	499	119	1½"	P	413	"	0.9592	"	21.47	
			1½"	S	409	"	0.9592	"	21.26	42.73
0900	502	122	1½"	P	414	"	0.9576	"	21.49	
			1½"	S	410	"	0.9576	"	21.28	42.77
0915	503	125	1½"	P	413	"	0.9576	"	21.43	
			1½"	S	412	"	0.0576	"	21.38	42.81
0930	504	126	1½"	P	415	"	0.9576	"	21.54	
			1½"	S	413	"	0.9576	"	21.43	42.97
0945	506	129	1½"	P	417	"	0.9568	"	21.62	
			1½"	S	414	"	0.9568	"	21.47	43.09
1000	507	128	1½"	P	417	"	0.9551	"	21.58	
			1½"	S	415	"	0.9551	"	21.48	43.06
1015	509	127	1½"	P	418	"	0.9526	"	21.58	
			1½"	S	416	"	0.9526	"	21.48	43.06
1030	511	126	1½"	P	419	"	0.9534	"	21.66	
			1½"	S	417	"	0.9534	"	21.56	43.22
1045	511	126	1½"	P	420	"	0.9534	"	21.71	
			1½"	S	418	"	0.9534	"	21.61	43.32
1100	512	131	1½"	P	420	"	0.9493	"	21.61	
			1½"	S	418	"	0.9493	"	21.50	43.11



TIME	WELLHEAD		REMARKS
	TEMP °F	PRESS PSIG	
1205			Shut in well
1210	133	3650	
1215	112	3840	
1230	87	3855	
1245	72	3855	
1300	65	3854	
1315	63	3854	
1330	62	3854	
1345	61	3850	
1400	60	3845	
1415	60	3841	
1430	60	3838	
1445	59	3835	
1500	59	3832	
1515	60	3829	
1530	61	3827	
1545	61	3825	
1600	60	3824	
1615	60	3823	
1630	60	3822	
1645	60	3824	
1700	60	3826	
1715	60	3824	
1718			Opened well, had leak, shut-in and repaired.
1730	60	3819	
1745	60	3805	
1753	60		Opened well to separator

DATE: October 3, 1968

WELL: 7/11-2X

METER RUN SIZE: 6.065 I.D.



PHILLIPS PETROLEUM CO.

WELL PRODUCTION TEST

Sheet 7 of

TEST NO.: DST 2

PERF.ZONE: 9932'-10190'

GAS OIL WATER

WELLHEAD.			METER ORIFICE	DIFF hw	METER PRESS psia	METER TEMP °F	$\sqrt{hw P}$	1	2	3	4	C	mmcf	bpd	bpd			
TIME	PRESS	TEMP						F _{1f}	F _b	F _b x 24	F _g	F _{pv}				F _{1f} x F _b x F _g x F _{pv}	C _g $\sqrt{hw P}$	
1753							Opened well for test											
1815	3600	82	2.5"	16	465	52	86.20	1.0078	1288.2	30916	1.2127	1.0393	39269	3.38		None		
1830	3596	85	2.5"	17	465	55	88.85	1.0048	1288.2	30916	1.2127	1.0384	39120	3.47	743	None		
1845	3630	90	2.5"	14	465	60	80.63	1.0000	1288.2	30916	1.2127	1.0369	38878	3.13	368	None		
1900	3715	81	2.5"	6	465	50	52.79	1.0098	1288.2	30916	1.2127	1.0398	36943	1.95	473	None		
1915	3700	83	2.5"	6	465	50	52.79	1.0098	1288.2	30916	1.2127	1.0398	36943	1.95	245	None		
1925							Changed control to 1/4" heater choke											None
1930	3607	86	2.5"	24	465	66	105.60	0.9943	1288.2	30916	1.2127	1.0354	38599	4.07	666	None		
1945	3617	90	2.5"	19	465	64	93.93	0.9962	1288.2	30916	1.2127	1.0359	38693	3.63	455	None		
2000	N.R.	87	2.5"	19	465	64	93.93	0.9962	1288.2	30916	1.2127	1.0359	38693	3.63	526	None		
														Average	3.54	504	None	
																	Average GOR 7024	
																	Color of condensate - Straw yellow	
																	Gravity of condensate - 51.6° API	
																	Heater bath temperature - 140°F	
																	Separator temperature - 64°F	
																	Assumed gas gravity - 0.68	

DATE: October 3, 1968



PHILLIPS PETROLEUM CO.

Sheet 9 of

WELL: 7/11-2X

TEST NO.: DST 2

METER RUN SIZE: 6.065" I.D.

WELL PRODUCTION TEST

PERF.ZONE: 9932'-10190'

GAS OIL WATER

WELLHEAD.			METER ORIFICE	DIFF hw	METER PRESS psia	METER TEMP °F	$\sqrt{hw P}$	1	2	3	4	C	mmcf/d	bpd	bpd			
TIME	PRESS	TEMP						F _{1f}	F _b	F _b x 24	F _g	F _p v				F _{1f} x F _b x F _g x F _p v		
2200	3796	58°	2.5"				Opened well for flow No. 2											
2215	3240	92°	2.5"	65	815	60	230.08	1.0000	1288.2	30916	1.2127	1.0676	40026	9.21		NIL		
2230	3244	99°	2.5"	73	815	67	243.83	0.9933	1288.2	30916	1.2127	1.0638	39617	9.66	1100	"		
2245	3250	106°	2.5"	73	815	66	243.83	0.9943	1288.2	30916	1.2127	1.0643	39675	9.67	770	"		
2300	3259	109°	2.5"	72	815	77	242.15	0.9840	1288.2	30916	1.2127	1.0588	39061	9.46	1040	"		
2315	3264	110°	2.5"	72	815	80	242.15	0.9813	1288.2	30916	1.2127	1.0575	38906	9.42	1020	"		
2330	3269	113°	2.5"	71	815	80	240.46	0.9813	1288.2	30916	1.2127	1.0575	38906	9.36	1070	"		
2345	3274	115°	2.5"	71	815	80	240.46	0.9813	1288.2	30916	1.2127	1.0575	38906	9.36	1360	"		
2400	3278	116°	2.5"	71	815	80	240.46	0.9813	1288.2	30916	1.2127	1.0575	38906	9.36	940	"		
													Average	9.36	1043	"		
													Average GOR : 8950					
Color of condensate - Straw yellow																		
Gravity of condensate - 52.1° API																		
Heater bath temperature - 118°F																		
Separator temperature - 80°F																		
Assumed gas gravity - 0.68																		

DATE: October 4, 1968

WELL: 7/11-2X

METER RUN SIZE: 6.065" I.D.



PHILLIPS PETROLEUM CO.

WELL PRODUCTION TEST

Sheet 14 of 14

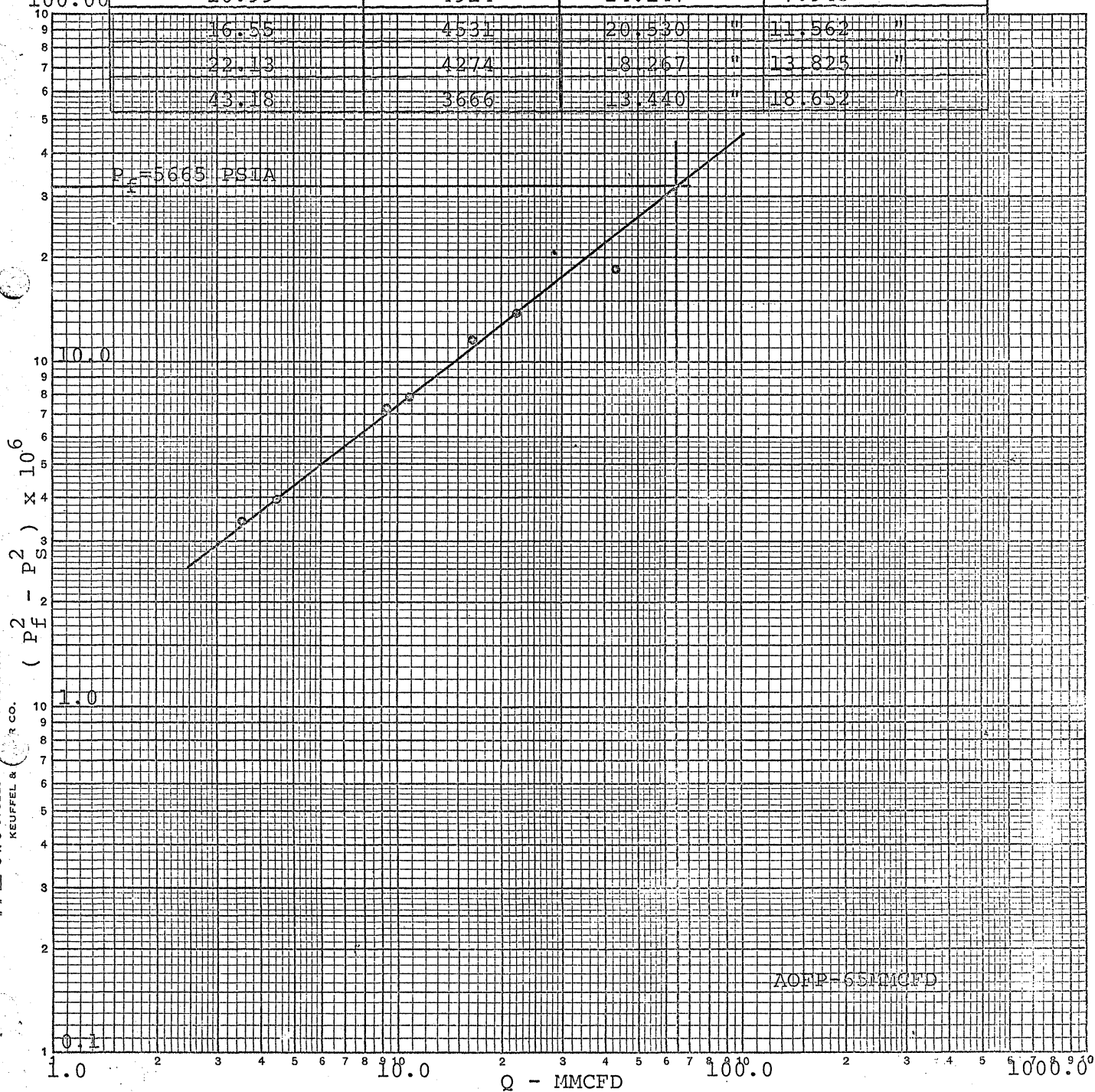
TEST NO.: DST 2

PERF.ZONE: 9932'-10109'

GAS OIL WATER

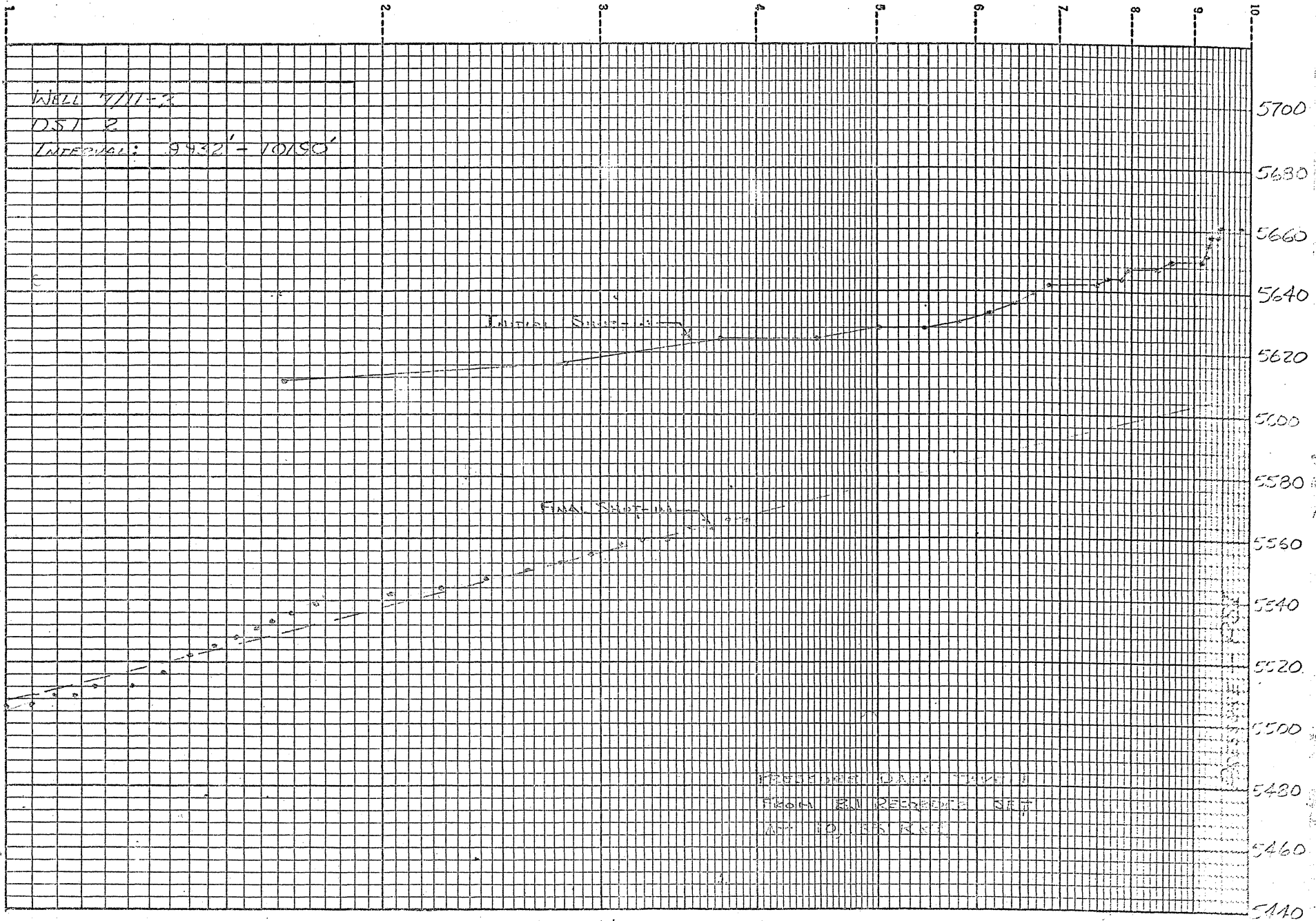
WELLHEAD.			METER ORIFICE	DIFF hw	METER PRESS	METER TEMP	$\sqrt{hw P}$	1	2	3	4	C	mmcf/d	bpd	bpd			
TIME	PRESS	TEMP			psia	°F		Ftf	Fb	Fb x 24	Fg	Fpv	FtfxFbxFgxFpy	C $\sqrt{hw P}$				
0815	2258	164	4"	46	930	145	208.43	0.9271	3628.2	87076	1.2127	1.0398	101798	21.22	1254	None		
0830	2260	164	4"	46	930	148	208.43	0.9248	3628.2	87076	1.2127	1.0393	101497	21.16	1254	None		
0833							Changing flow rate to 10 mmcf/d											
0845	3227	163	4"	21	515	118	105.44	0.9485	3628.2	87076	1.2127	1.0273	102895	10.85	935	None		
0900	3236	159	4"	21	515	112	105.44	0.9535	3628.2	87076	1.2127	1.0284	103549	10.92	1109	None		
0915	3240	157	4"	21	515	108	105.44	0.9567	3628.2	87076	1.2127	1.0292	103978	10.96	1667	None		
0930	3241	157	4"	21	515	105	105.44	0.9593	3628.2	87076	1.2127	1.0298	104321	10.99	1372	None		
0945	3241	156	4"	21	515	105	105.44	0.9593	3628.2	87076	1.2127	1.0298	104321	10.99	703	None		
1000	3237	154	4"	21	515	105	105.44	0.9593	3628.2	87076	1.2127	1.0298	104321	10.99	1109	None		
1003							Changing flow rate to 5 mmcf/d											
1015	3669	136	2"	68	515	90	189.73	0.9723	814.41	19545	1.2127	1.0332	23811	4.52	515	None		
1030	3665	129	2"	67	515	82	188.33	0.9795	814.41	19545	1.2127	1.0352	24033	4.53	N.R.	None		
1045	3604	NR	2"	66	515	82	186.92	0.9795	814.41	19545	1.2127	1.0352	24033	4.49	523	None		
1100	3602	NR	2"	66	515	80	186.92	0.9813	814.41	19545	1.2127	1.0356	24087	4.50	413	None		
1115	NR	NR	2"	66	515	80	186.92	0.9813	814.41	19545	1.2127	1.0356	24087	4.50	651	None		
1130	NR	NR	2"	66	515	79	186.92	0.9822	814.41	19545	1.2127	1.0359	24116	4.51	420	None		
1145	NR	NR	2"	66	515	79	186.92	0.9822	814.41	19545	1.2127	1.0359	24116	4.51	529	None		
1200	NR	NR	2"	66	515	76	186.92	0.9850	814.41	19545	1.2127	1.0367	24203	4.52	N.R.	None		
1215	NR	NR	2"	66	515	76	186.92	0.9850	814.41	19545	1.2127	1.0367	24203	4.52	444	None		
1230	NR	NR	2"	66	515	76	186.92	0.9850	814.41	19545	1.2127	1.0367	24203	4.52	430	None		
1245	NR	NR	2"	60	515	76	178.22	0.9850	814.41	19545	1.2127	1.0367	24203	4.31	388	None		
1300	NR	NR	2"	62	515	76	181.17	0.9850	814.41	19545	1.2127	1.0367	24203	4.38	394	None		
1312	NR	NR					Well shut in											

RATE - MMCFD	BHP - PSIA	BHP ²	(P _f ² - P _s ²) x 10 ⁶
0	5665	32.092 x 10 ⁶	
3.54	5356	28.687 "	3.405 "
4.52	5306	28.154 "	3.938 "
9.36	4976	24.760 "	7.332 "
10.99	4914	24.147 "	7.945 "
16.55	4531	20.530 "	11.562 "
22.13	4274	18.267 "	13.825 "
43.18	3666	13.440 "	18.652 "



KE LOGARITHMIC
 3 X 3 CYCLES
 KEUFFEL & CO.
 46 7403
 MADE IN U.S.A.

Well 7/11-2X
 Interval 9932' - 10190'
 Press Datum 10,135'
 Date Oct. 2, 1968
 Test No. DS 2



$$\frac{\Delta t}{t + \Delta t}$$