

MULTI-POINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Revised 1-1-65

Type Test ☒ Initial ☐ Annual ☐ Special		Test Date 7-5-78	
Company W. A. Moncrief, Jr.		Connection	
Pool Hume Gas Field		Formation Morrow	
Completion Date 7-5-78		Total Depth 14110	Plug Back TD 12800
		Elevation 4148 D. F.	Farm or Lease Name Phillips State
Cas. Size 5.50"	Wt. 20.00#	d 4.778"	Set At 14107
Perforations: From 12580	To 12590		Well No. 1-Y
Perforations: From	To		Unit I
2.875 EUE	6.60#	2.441"	12386
Type Well - Single - Rodenthead - G.G. or G.O. Multiple Single Completion			County Lea
Producing Thru Tubing	Reservoir Temp. °F 208	Mean Annual Temp. °F 60	Baro. Press. - P _a 13.2
State New Mexico			
L 12585	H 12585	Gg 0.665	% CO ₂ 0.41
		% N ₂ 1.19	% H ₂ S 0.00
Prover		Meter Run x	Taps

FLOW DATA						TUBING DATA		CASING DATA		Direction of Flow
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. °F	Press. p.s.i.g.	Temp. °F	Press. p.s.i.g.	
1	4.00	1.50	450	16.00"	98	3135	60			
2	4.00	1.50	450	64.00"	105	2650	60			
3	4.00	1.50	490	57.00"	110	2290	60			
4										
5										

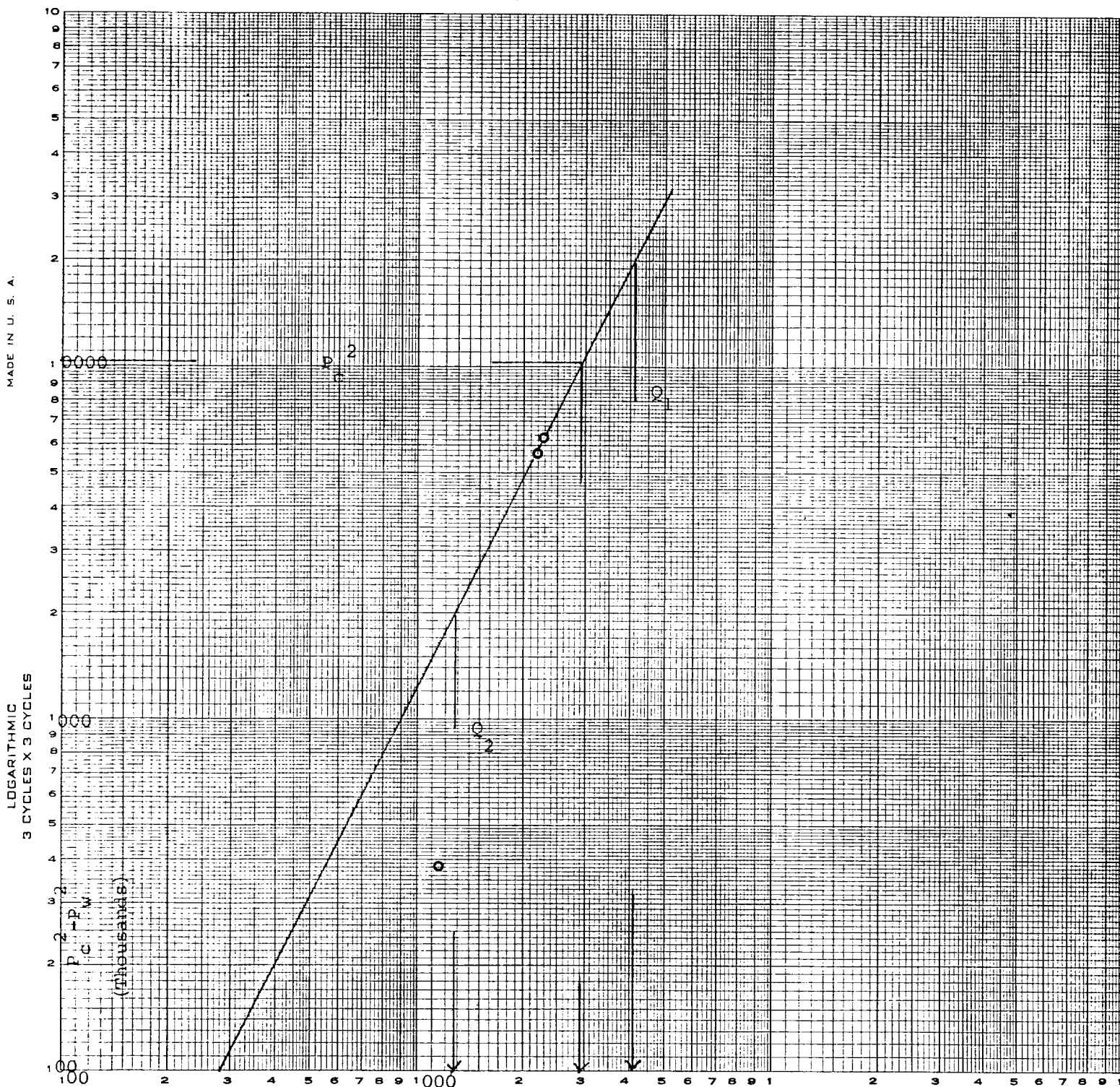
RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor Ft	Gravity Factor Fg	Super Compress. Factor, Fpv	Rate of Flow Q, Mcfd
1	10.84	86.088	463.20	0.9653	1.2263	1.0400	1149
2	10.84	172.177	463.20	0.9594	1.2263	1.0390	2281
3	10.84	169.359	503.20	0.9551	1.2263	1.0230	2200
4							
5							

NO.	P _r	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio	A.P.I. Gravity of Liquid Hydrocarbons	Specific Gravity Separator Gas	Specific Gravity Flowing Fluid	Critical Pressure	Critical Temperature
1	0.69	558	1.46	0.922	10160	56.40	0.665		669	382
2	0.69	565	1.48	0.922						
3	0.75	570	1.49	0.949						
4										
5										

P _c 3213.2	P _c ² 10325	$(1) \frac{P_c^2}{P_c^2 - P_w^2} = 1.63603$		$(2) \left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.27845$	
NO.	P _i ²	P _w	P _w ²	P _c ² - P _w ²	
1		3140.5	9863	462	
2		2003.5	4014	6311	
3		2135.2	4559	5766	
4					
5					

Absolute Open Flow		2,916		Mcf @ 15.025		Angle of Slope @		63.5		Slope, n		.499			
Remarks:															
Approved By Commission:				Conducted By:				Calculated By:				Checked By:			
				West Texas Engineering				Eddy Moore							

COMPANY: Moncreif Oil Company
 LEASE: Phillip State
 WELL NO.: 1-Y
 DATE: July 24, 1978
 POOL: Home



Q in MCF/Day
 $\theta = 63.5$
 $n = .499$

Q₁ = 4100 MCF
 Q₂ = 1296 MCF

Log Q₁ = 3.61278
 Log Q₂ = 3.11278
 $n = .49999$

Absolute Open Flow = 2916 MCF/Day

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JUL 28 1978

U.S. CONSERVATION COMM.
WASH., D. C.

WORK SHEET FOR STEPWISE CALCULATION

(SUBSURFACE) PRESSURE (P_f & P_s)
 (P_c & P_w)
 RATE #1

Form C-122-E

MPANY Moncreif Oil Company LEASE Phillip State WELL NO. 1-Y DATE July 24, 1978

CATION: UNIT SECTION TOWNSHIP RANGE
 12585 H 12585 L/H 1.00 G 0.935 % CO₂ 0.41 %N₂ 1.19 %H₂S 0.00
 d 2.441 F_r 0.010763 Q_m 1.149 M² cfd (L/H) (F_r Q_m)² 0.000153 P_{cr} 661 T_{cr} 471

NE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		0	6293			12585					
2	GH		0	5883			11767					
3	37.5GH		0	220631			441262					
4	P _c or P _n		3148.2	4155.2	4110.2	4118.2	5089.2	5025.2				
5	P _r		4.76	6.29	6.22	6.23	7.70	7.60				
6	T		520	594	594	594	668	668				
7	T _r		1.10	1.26	1.26	1.26	1.42	1.42				
8	Z		0.664	0.839	0.817	0.817	0.958	0.951				
9	P/Z P/Z		4741.27	4953.74	5029.61	5039.40	5310.10	5281.90				
0	P/TZ		9.1178	8.3396	8.4674	8.4838	7.9493	7.9070				
1	(P/TZ) ² /1000		0.083135	0.069550	0.071696	0.071976	0.063191	0.062521				
2	L/H(F _r Q _m) ²		0.000153	0.000153	0.000153	0.000153	0.000153	0.000153				
3			11 + 12	0.069702	0.071849	0.072129	0.063344	0.062674				
4	I _n		109.474	119.646	117.849	117.621	125.494	126.161				
5	M=P _n -P _{n-1}			1007	962	970	971	907	905			
6	N=1 _n + 1 _{n-1}			229.120	227.323	227.095	243.115	243.782				
7	M x N		15 x 16			220282		221110				
8	Σ (M x N)		Σ 17			220282		441392				

Delta P = $\frac{3[441262]}{109.474 + 4[117.621] + 126.161} = \frac{1323785}{706.119} = 1874.7$ P = 3148.2 + 1874.7 = 5022.9

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JUL 28 1978

COMMUNICATIONS SECTION
U.S. AIR FORCE

WORK SHEET FOR STEPWISE CALCULATION

Form C-122-E

(SUBSURFACE) PRESSURE (P_f & P_s)
(P_c & P_w)
RATE #2

IPANY Moncreif Oil Company LEASE Phillip State WELL NO. 1-Y DATE July 24, 1978

SECTION TOWNSHIP RANGE

12585 H 12585 L/H 1.00 G 0.935 % CO₂ 0.41 % N₂ 1.19 % H₂S 0.00
d 2.441 F_r 0.010763 Q_m 2.281 M² cfd (L/H) (F_r Q_m)² 0.000603 P_{cr} 661 T_{cr} 471

IE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
H			0	6293			12585					
GH			0	5883			11767					
37.5GH			0	220631			441262					
P _c or P _n			2663.2	3284.2	3328.2	3331.2	3999.2	4090.2	4094.2			
P _r			4.03	4.97	5.04	5.04	6.05	6.19	6.19			
T			668	668	668	668	668	668	668			
T _r			1.42	1.42	1.42	1.42	1.42	1.42	1.42			
Z			0.722	0.768	0.771	0.771	0.836	0.847	0.847			
P/Z P/Z			3688.64	4275.19	4317.85	4321.74	4784.88	4830.18	4831.48			
P/TZ			5.5219	6.4000	6.4638	6.4697	7.1630	7.2308	7.2328			
(P/TZ) ² /1000			0.030492	0.040960	0.041781	0.041857	0.051308	0.052285	0.052313			
L/H(F _r Q _m) ²			0.000603	0.000603	0.000603	0.000603	0.000603	0.000603	0.000603			
I _n			0.031094	0.041563	0.042384	0.042459	0.051911	0.052887	0.052916			
M=P _n -P _{n-1}			177.586	153.985	152.507	152.373	137.986	136.721	136.685			
N=1 _n +1 _{n-1}				621	665	668	668	759	763			
M x N				331.571	330.093	329.959	290.359	289.094	289.058			
Σ (M x N)						220413			220551			
						220413			303967			

$$\Delta P = \frac{3[240261]}{177.586 + 4[152.373]} + 136.685 = \frac{720784}{923.763} = 780.3 \quad P = 2863.2 + 780.3 = 3643.5$$

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JUL 28 1978

CONSERVATION COMM.
HARRIS, H. M.

(SURFACE)

WORK SHEET FOR STEPWISE CALCULATION

RATE #2

IPANY Moncreif Oil Company LEASE Phillip State TOWNSHIP RANGE WELL NO. 1-Y DATE July 24, 1978

SECTION 12585 H 12585 L/H 1.00 G 0.935 & CO₂ 0.41 & N₂ 1.19 & H₂S 0.00

d F_r Q_m M² cfd (L/H) (F_r Q_m)² P_{cr} T_{cr} 471

IE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
	H		12585	6293		0						
	GH		11767	5883		0						
	37.5GH		441262	220631		0						
	P _c or P _n		3643.5	2875.2	2856.0	2069.9	1978.4	1982.1				
	P _r		5.51	4.35	4.32	3.13	2.99	3.00				
	T		668	594	594	520	520	520				
	T _r		1.42	1.26	1.26	1.10	1.10	1.10				
	Z		0.783	0.661	0.659	0.455	0.439	0.439				
	P/Z P/Z	4 ÷ 8	4652.07	4349.84	4332.45	4549.32	4506.54	4515.13				
	P/TZ	9 ÷ 6	6.9642	7.3230	7.2937	8.7487	8.6664	8.6829				
	(P/TZ) ² /1000	(10 ² /1000)										
	L/H(F _r Q _m) ²											
	I _n	11 + 12										
	M=P _n -P _{n-1}	10 ÷ 13	143.592	136.557	137.105	114.303	115.388	115.168				
	N=1 _n +1 _{n-1}			768	788	786	878	874	875			
	M x N	15 x 16		280.149	280.697	251.408	252.493	252.273				
	Σ (M x N)	Σ 17		221189	221189			220486				

Delta P =
$$\frac{3[441262]}{143.592 + 4[137.105] + 115.168} = \frac{1323785}{807.180} = 1640.0$$
$$P = 3643.5 - 1640.0 = 2003.5$$

WORK SHEET FOR STEPWISE CALCULATION

(SURFACE)

PRESSURE

(P_f & P_s)

(P_c & P_w)

Form C-122-E

MPANY Moncreif Oil Company LEASE Phillip State WELL NO. 1-Y DATE July 24, 1978

CATION: UNIT SECTION TOWNSHIP RANGE

12585 H 12585 L/H 1.00 G 0.935 % CO₂ 0.41 % N₂ 1.19 % H₂S 0.00
d F_r Q_m M² cfd (L/H) (F_r Q_m)² P_{cr} 661 T_{cr} 471

NE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		12585	6293		0						
2	GH		11767	5883		0						
3	37.5GH		441262	220631		0						
4	P _c or P _n		3810.2	3041.3	3011.5	2214.4	2115.6	2118.7				
5	P _r		5.76	4.60	4.56	3.35	3.20	3.21				
6	T		668	594	594	520	520	520				
7	T _r		1.42	1.26	1.26	1.10	1.10	1.10				
8	Z		0.818	0.680	0.676	0.481	0.463	0.463				
9	P/Z P/Z	$\bar{4} \div \bar{8}$	4655.67	4473.89	4456.26	4603.74	4569.26	4575.94				
0	P/TZ	$\bar{9} \div \bar{6}$	6.9696	7.5318	7.5021	8.8533	8.7870	8.7999				
1	(P/TZ) ² /1000	(10 ² /1000)										
2	L/H (F _r Q _m) ²											
3		$\bar{11} + \bar{12}$										
4	I _n	$\bar{10} \div \bar{13}$	143.481	132.770	133.296	112.952	113.804	113.638				
5	M = P _n - P _{n-1}			769	799	797	896	893	893			
6	N = L _n + L _{n-1}			276.251	276.777	246.247	247.100	246.934				
7	M x N	$\bar{15} \times \bar{16}$			221145			220512				
8	$\Sigma (M \times N)$	$\Sigma \bar{17}$			221145			282121				

Delta P = $\frac{3[441262]}{143.481 + 4[133.296] + 113.638} = \frac{1323785}{790.303} = 1675.0$ P = 3810.2 - 1675.0 = 2135.2

WORK SHEET FOR STEPWISE CALCULATION

(SUBSURFACE)

(P_f & P_s)

PRESSURE

Form C-122-E

~~XXXXXXXX~~

(P_c & P_w)

RATE #3

MPANY Moncreif Oil Company LEASE Phillip State WELL NO. 1-Y DATE July 24, 1978

CATION: UNIT SECTION TOWNSHIP RANGE

12585 H 12585 L/H 1.00 G 0.935 % CO₂ 0.41 % N₂ 1.19 % H₂S 0.00
d 2.441 F_r 0.010763 Q_m 2.200 M² cfd (L/H) (F_r Q_m)² 0.000561 P_{cr} 661 T_{cr} 471

NE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	I _H		0	6293			12585					
2	G _H		0	5883			11767					
3	37.5GH		0	220631			441262					
4	P _c or P _n		2303.2	3291.2	3228.2	3224.2	4144.2	4059.2	4055.2			
5	P _r		3.48	4.98	4.88	4.88	6.27	6.14	6.13			
6	T		520	594	594	594	668	668	668			
7	T _r		1.10	1.26	1.26	1.26	1.42	1.42	1.42			
8	Z		0.498	0.709	0.701	0.701	0.854	0.844	0.844			
9	P/Z P/Z	4 ÷ 8	4624.90	4640.72	4603.82	4598.12	4854.97	4810.62	4805.88			
0	P/TZ	9 ÷ 6	8.8940	7.8127	7.7505	7.7409	7.2679	7.2015	7.1944			
1	(P/TZ ² /1000	(10 ² /1000	0.079104	0.061038	0.060071	0.059922	0.052823	0.051862	0.051760			
2	L/H(F _r Q _m) ²		0.000561	0.000561	0.000561	0.000561	0.000561	0.000561	0.000561			
3		11 ÷ 12	0.079665	0.061598	0.060632	0.060483	0.053383	0.052423	0.052320			
4	I _n	10 ÷ 13	111.644	126.832	127.830	127.986	136.146	137.374	137.507			
5	M=P _n -P _{n-1}			988	925	921	920	835	831	831		
6	N=1 _n +1 _{n-1}			238.476	239.474	239.629	264.132	265.360	265.493			
7	M x N	15 x 16				220698			220624			
8	Σ (M x N)	Σ 17				220698			221185			

Delta P = $\frac{3[240261]}{111.644 + 4[127.986]} + 137.507 = \frac{720784}{761.095} = 947.0$
P = 2863.2 + 947.0 = 3810.2