

NEW MEXICO OIL CONSERVATION COMMISSION
MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Form C-122
Revised 9-1-65

Type Test ☒ Initial ☐ Annual ☐ Special						Test Date 12-20-77			
Company Texas Pacific Oil Company, Inc.				Connection					
Pool Jalmat Gas				Formation Yates - 7 Rivers				Unit	
Completion Date 12-16-77		Total Depth		Plug Back TD		Elevation 3345 GL		Farm or Lease Name State A A/C-1	
Csg. Size 5 1/2"	Wt. 14.0#	d 5.012"	Set At 3659	Perforations: From 2900 To 3354		Well No. 53			
Tbg. Size 2 3/8"	Wt. 4.7#	d 1.995"	Set At 3400	Perforations: From To		Unit Sec. Twp. Rge. E 24 23S 36E			
Type Well - Single - Bradenhead - G.G. or G.O. Multiple Gas Oil Dual						Packer Set At 3375		County Lea	
Producing Thru Annulus		Reservoir Temp. °F EST 84 @ 3127		Mean Annual Temp. °F 60		Baro. Press. - P _a 13.2		State New Mexico	
L 3127	H 3127	G _g est 0.675	% CO ₂ NA	% N ₂ NA	% H ₂ S NA	Prover 2" orifice well		Meter Run Taps testers	

FLOW DATA						TUBING DATA		CASING DATA		Duration 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.	
SI							Packer - Choke		159.0	
1.	2" OWT - 1.25"			2.0	-	58	16/64"		155.0	58
2.	2" OWT - 1.25"			5.0	-	58	22/64"		154.0	58
3.	2" OWT - 1.25"			11.5	-	60	26/64"		152.0	60
4.	2" OWT - 1.25"			20.0	-	56	30/64"		149.0	56
5.										

RATE OF FLOW CALCULATIONS							
NO.	Volume Coefficient from GOR Manual (21 pur)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1	310.9	-	15.2	1.0019	0.9427	1.000	294
2	507.4	-	18.2	1.0019	0.9427	1.000	479
3	818.9	-	24.7	1.0000	0.9427	1.000	772
4	1160	-	33.2	1.0039	0.9427	1.000	1098
5							

NO.	P _r	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio _____ Mcf/bbl.
1.					A.P.I. Gravity of Liquid Hydrocarbons _____ Deg.
2.					Specific Gravity Separator Gas 0.675 XXXXXXXXXX
3.	Not applicable due				Specific Gravity Flowing Fluid XXXXX
4.	to low pressures				Critical Pressure 669 _____ P.S.I.A.
5.					Critical Temperature 382 _____ R

P _c 172.2 P _c ² 29.65					(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 4.322$	(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 3.155$
NO.	P _r ²	P _w	R _w ²	P _c ² - R _w ²		
1			28.32	1.33		
2			28.05	1.60		
3			27.51	2.14		
4			26.76	2.89		
5						

Absolute Open Flow 6755 Mcfd @ 15.025			Angle of Slope 51.9 °	Slope, n 0.785
Remarks: Ran 6 rates - good point alignment				
Approved By Commission: <i>[Signature]</i>	Conducted By: <i>Ralph B. Durin</i>	Calculated By: Roy West	Checked By:	

NEW MEXICO OIL CONSERVATION COMMISSION
MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Form C-122
Revised 9-1-65

Type Test ☐ Initial ☐ Annual ☐ Special					Test Date			
Company				Connection				
Pool				Formation				Unit
Completion Date		Total Depth		Plug Back TD		Elevation		Farm or Lease Name
Csg. Size	Wt.	d	Set At	Perforations: From To				Well No.
Tbg. Size	Wt.	d	Set At	Perforations: From To				Unit Sec. Twp. Rge.
Type Well - Single - Bradenhead - G.G. or G.O. Multiple						Packer Set At		County
Producing Thru		Reservoir Temp. °F a		Mean Annual Temp. °F		Baro. Press. - P _a		State
L	H	Gg	% CO ₂	% N ₂	% H ₂ S	Prover 4" Prover		Meter Run Taps

FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
NO.	Prover Type 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.		Temp. °F
SI	Packer - Choke										
1.	4"	-	2.00"	6.0	-	59	35/64"		144.0	59	60 min.
2.	4"	-	2.00"	13.0	-	59	48/64"		132.0	59	45 min.
3.											
4.											
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1	67.08	-	19.2	1.001	1.217	1.0000	1569
2	67.08	-	26.2	1.001	1.217	1.0000	2141
3.							
4.							
5.							

NO.	P _t	Temp. °R	T _f	Z	Gas Liquid Hydrocarbon Ratio _____ Mcf/bbl.
1.					A.P.I. Gravity of Liquid Hydrocarbons _____ Deg.
2.	Not applicable due to low pressures				Specific Gravity Separator Gas 0.675 XXXXXXXXXX
3.					Specific Gravity Flowing Fluid XXXXX
4.					Critical Pressure _____ P.S.I.A. P.S.I.A.
5.					Critical Temperature _____ R R

P _c 172.2 P _c ² 29.65				
NO.	P _t ²	P _w	P _w ²	P _c ² - P _w ²
1			25.62	4.03
2			22.79	6.86
3				
4				
5				

(1) $\frac{P_c^2}{P_c^2 - P_w^2} = \underline{\hspace{2cm}}$ (2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = \underline{\hspace{2cm}}$

ACF = Q $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = \underline{\hspace{2cm}}$

Absolute Open Flow _____ Mcfd @ 15.025		Angle of Slope θ _____	Slope, n _____
Remarks: _____			

Approved By Commission:	Conducted By: <i>Ralph E. Ewing</i>	Calculated By:	Checked By:
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WORKSHEET FOR CALCULATION OF STATIC COLUMN WELLHEAD PRESSURE (P_w)Form C-122D
Adopted 9-1-65COMPANY Texas Pacific Oil Co., Indease State "A" A/C-1WELL NO. 53DATE 12-20-77LOCATION: Unit E Section 24 Township 23-S Range 36-EL 3127 H 3127 L/H 1.000 G 0.675 % CO₂ NA % N₂ NA % H₂S NA d 5.012" F_r .0031403 GH 2110.7 P_{cr} 669 T_{cr} 382
TABLE IX & X TABLE IX & X

LINE	1st Rate	2nd Rate	3rd Rate	4th Rate		
1 Q_m	.294	.479	.772	1.098		
2 T_w (W.H. °R)	520	520	520	520		
3 T_s (B.H. °R)	544	544	544	544		
4 $T = (\frac{T_w + T_s}{2})$	532	532	532	532		
5 Z (Est.)	.966	.965	.966	.965	.967	
6 TZ	513.9	513.4	513.9	513.4	514.4	
7 GH/TZ	4.107	4.111	4.107	4.111	4.103	
8 e^s (Table XIV)	1.167	1.167	1.167	1.167	1.166	
9 $1-e^s$ (Table XIV)	.143	.143	.143	.143	.142	
10 P_t	168.2	167.2	165.2	162.2	162.2	
11 $P_t \cdot 2/1000$	28.29	27.96	27.29	26.31	26.31	
12 F_r (Table XV)	.0031403	.0031403	.0031403	.0031403	.0031403	
13 $F_c = F_r \cdot TZ$	1.614	1.614	1.614	1.612	1.615	
14 $F_c \cdot Q_m$	.475	.773	1.246	1.770	1.774	
15 $L/H (F_c \cdot Q_m)^2$	.225	.598	1.552	3.134	3.146	
16 $F_w = L/H (F_c \cdot Q_m)^2 (1-e^s)$	.032	.085	.2220	0.448	.447	
17 $P_w^2 = P_t^2 + F_w$	28.32	28.05	27.51	26.76	26.76	
18 $P_s^2 = e^s \cdot P_w^2$	33.05	32.73	32.11	31.23	31.20	
19 P_s	181.8	180.9	179.2	176.7	176.6	
20 $P = (\frac{P_t + P_s}{2})$	175.0	174.1	172.2	169.5	169.4	
21 $P_r = (P/P_{cr})$	0.26	0.26	0.26	0.25	0.25	
22 $T_r = (T/T_{cr})$	1.39	1.39	1.39	1.39	1.39	
23 Z (Table XI)	.966	.966	.966	.967	.967	

WORKSHEET FOR CALCULATION OF STATIC COLUMN WELLHEAD PRESSURE (P_w)Form C-1/22D
Adopted 9-1-65COMPANY Texas Pacific Oil Co., Inc-EASE State "A" A/C-1 WELL NO. 53 DATE 12-20-77LOCATION: Unit E Section 24 Township 23-S Range 36-EL 3127 H 3127 L/H 1.000 G 0.675 % CO₂ NA % N₂ NA % H₂S NAd 5.012" F_r .0031403 GH 2110.7P_{cr} 669 T_{cr} 382
TABLE IX & X TABLE IX & X

LINE	5th Rate	6th Rate							
1 Q _m	1.569	2.141							
2 T _w (W.H. °R)	520	520							
3 T _s (B.H. °R)	544	544							
4 T = ($\frac{L_w + T_s}{2}$)	532	532							
5 Z (Est.)	.970	.870	.969						
6 TZ	516.0	462.8	515.5						
7 GH/TZ	4.091	4.103	4.094						
8 e ^s (Table XIV)	1.166	1.185	1.166						
9 1-e ^s (Table XIV)	.142	.142	.142						
10 P _l	157.2	145.2	145.2						
11 P _l 2/1000	24.71	21.08	21.08						
12 F _r (Table XV)	.0031403	.0031403	.0031403						
13 F _c = F _r TZ	1.620	1.453	1.619						
14 F _c Q _m	2.542	3.112	3.466						
15 L/H (F _c Q _m) ²	6.464	9.682	12.012						
16 F _w = L/H (F _c Q _m) ² (1-e ^s)	.9179	1.530	1.706						
17 P _w ² = P _l ² + F _w	25.63	22.61	22.79						
18 P _s ² = e ^s P _w ²	29.88	26.79	26.57						
19 P _s	172.9	163.7	163.0						
20 P = ($\frac{P_l + P_s}{2}$)	165.0	154.4	154.1						
21 P _r = (P/P _{cr})	0.25	0.23	0.23						
22 T _r = (T/T _{cr})	1.39	1.39	1.39						
23 Z (Table XI)	.967	.969	.969						

Texas Pacific Oil Company, Inc.
 State "A" A/C-1 #53
 12-20-77 Imat Gas
 Sec. 24-23S-36E

$$\text{ABS. Slope } (n) = Q_1 = 4025 = 7.604766$$

$$Q_2 = 660 = 6.819544$$

$$(n) = 0.785222$$

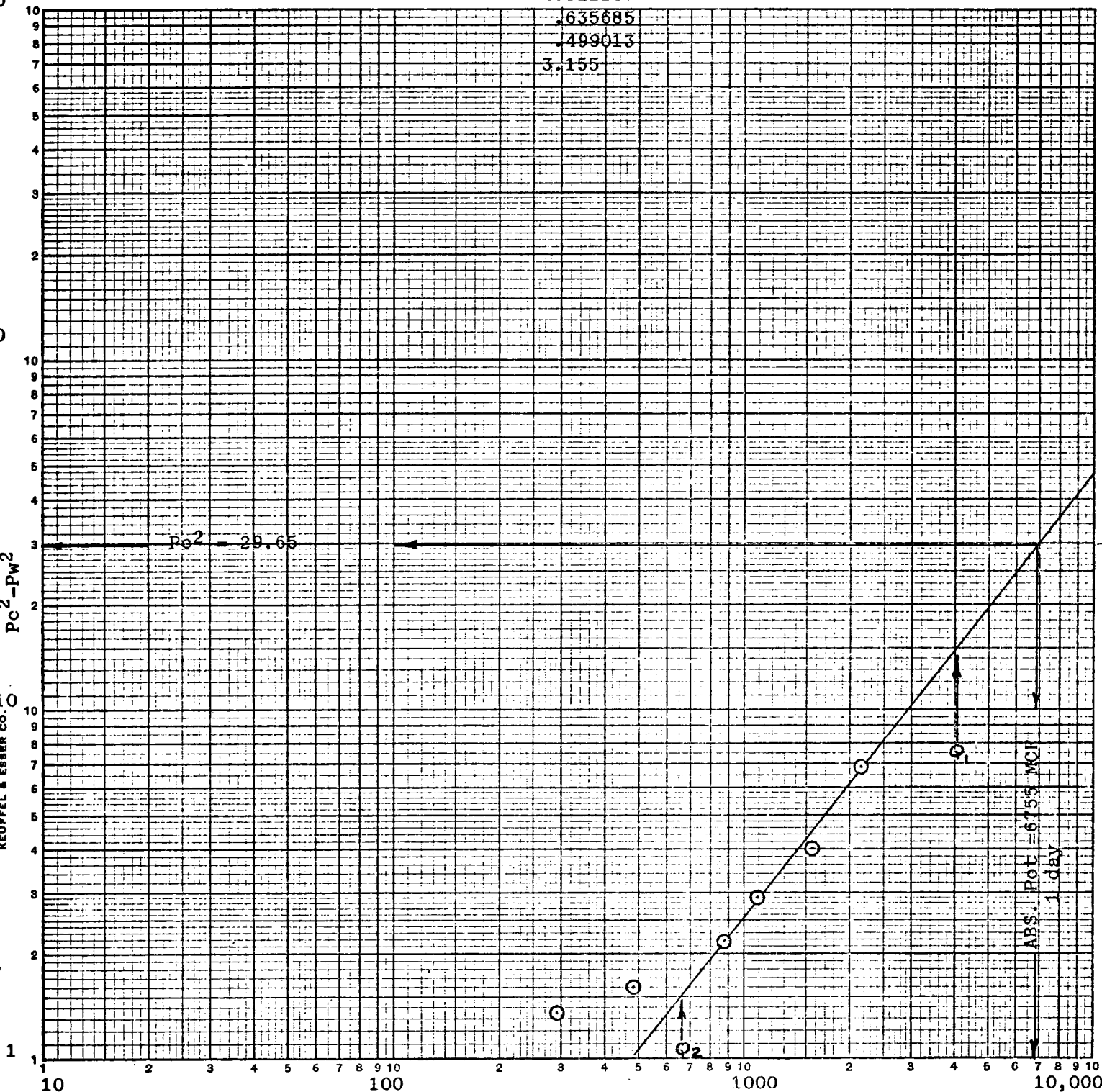
$$\text{ABS. Pot.} = 2141 \left(\frac{29.65}{6.86} \right)^{.785} = 6755 \text{ MCF 1 day}$$

1000

100

KE LOGARITHMIC 46 7400
 MADE IN U.S.A.
 KEUFFEL & ESSER CO. 10

$P_c^2 - P_w^2$



$Q = \text{MCF 1 day}$