

WORKSHEET FOR CALCULATION OF STATIC COLUMN WELLHEAD PRESSURE (Pw) C-122D

DATE 10/20/1999

COMPANY YATES PETROLEUM CORPORATION LEASE HICKORY ALV FEDERAL WELL NO. 2

LOCATION: Unit D Section 18 Township 22S Range 24E

L 10200 H 10200 L/H 1.000 G 0.654 %CO₂ 0.619 %N₂ 0.863 %H₂S 0.000

d 2.441 Fr 0.010495 GH 6670.8 Pcr 671.3 Tcr 370.4

LINE	1st Rate	2nd Rate	3rd Rate	4th Rate	5th Rate
1 Qm	0.473	0.524	0.579	0.622	
2 Tw(W.H.*R)	520	520	520	520	
3 Ts(B.H.*R)	590	590	590	590	
4 $T = (Tw + Ts) / 2$	554.7	554.7	554.7	554.7	
5 Z (Est.)	0.968	0.968	0.969	0.969	
6 TZ	536.9	537.0	537.3	537.5	
7 GH / TZ	12.426	12.421	12.415	12.411	
8 e^s (Table XIV)	1.594	1.593	1.593	1.593	
9 $1 - e^{-s}$ (Table XIV)	0.372	0.372	0.372	0.372	
10 Pt	183.2	180.2	176.2	173.2	
11 $Pt^2 / 1000$	33.6	32.5	31.0	30.0	
12 Fr (Table XV)	0.010495	0.010495	0.010495	0.010495	
13 $Fc = FrTZ$	5.634	5.636	5.639	5.641	
14 FcQm	2.67	2.95	3.27	3.51	
15 $L / H(FcQm)^2$	7.1	8.7	10.7	12.3	
16 $Fw = L / H(FcQm)^2(1 - e^{-s})$	2.65	3.25	3.97	4.58	
17 $Pw^2 = Pt^2 + Fw$	36.2	35.7	35.0	34.6	
18 $Ps^2 = e^s Pw^2$	57.7	56.9	55.8	55.1	
19 Ps	240.2	238.6	236.2	234.7	
20 $P = (Pt + Ps) / 2$	211.7	209.4	206.2	203.9	
21 $Pr = (P / Pcr)$	0.32	0.31	0.31	0.30	
22 $Tr = (T / Tcr)$	1.50	1.50	1.50	1.50	
23 Z (Table XI)	0.968	0.968	0.969	0.969	