

WORKSHEET FOR CALCULATION OF STATIC COLUMN WELLHEAD PRESSURE (P_w)

Form C-122D
Adopted 9-1-65

COMPANY Atlantic Richfield LEASE McDonald State (WN) WELL NO. 23 DATE 5-20/5-24-74

LOCATION: Unit C Section 15 Township 22S Range 36E

L 3254 H 3254 L/H 1.000 G .692 % CO₂ --- % N₂ --- % H₂S ---

d 1.995 F_i .018231 GH 2252 P_{cr} 669 T_{cr} 388

1st Rate 2nd Rate 3rd Rate 4th Rate

LINE	Trial 1	Trial 2	Trial 1	Trial 2	Trial 1	Trial 2	Trial 1	Trial 2
1 Q _m	.337	.337	.455	.455	.697	.697	.835	.835
2 T _w (W.H. °R)	534	534	534	534	534	534	534	534
3 T _s (B.H. °R)	548	548	548	548	548	548	548	548
4 T = ($\frac{T_w + T_s}{2}$)	541	541	541	541	541	541	541	541
5 Z (Est.)	.952	.949	.958	.956	.963	.960	.969	.966
6 TZ	515.0	513.4	518.3	517.2	521.0	519.4	524.2	522.6
7 GH/TZ	4.373	4.386	4.345	4.354	4.323	4.336	4.296	4.309
8 e ^s (Table XIV)	1.178	1.179	1.177	1.177	1.176	1.177	1.175	1.175
9 1-e ^s (Table XIV)	.151	.152	.150	.151	.150	.150	.149	.149
10 P _t	252.2	252.2	218.2	218.2	196.2	196.2	159.2	159.2
11 P _t 2/1000	63.6	63.6	47.6	47.6	38.5	38.5	25.3	25.3
12 F _r (Table XV)	.018231	.018231	.018231	.018231	.018231	.018231	.018231	.018231
13 F _c = F _r TZ	9.39	9.36	9.45	9.43	9.50	9.47	9.56	9.53
14 F _c Q _m	3.164	3.154	4.299	4.290	6.620	6.600	7.980	7.956
15 L/H (F _c Q _m) ²	10.013	9.950	18.483	18.406	43.826	43.554	63.685	63.291
16 F _w = L/H (F _c Q _m) ² (1-e ^s)	1.514	1.509	2.779	2.773	6.558	6.536	9.476	9.444
17 P _w ² = P _t ² + F _w	65.1	65.1	50.4	50.4	45.1	45.0	34.8	34.8
18 P _s ² = e ^s P _w ²	76.7	76.8	59.3	59.3	53.0	53.0	40.9	40.9
19 P _s	277.0	277.0	243.5	243.6	230.2	230.2	202.3	202.2
20 P = ($\frac{P_t + P_s}{2}$)	264.6	264.6	230.9	230.9	213.2	213.2	180.7	180.7
21 P _r = (P/P _{cr})	.40	.40	.35	.35	.32	.32	.27	.27
22 T _r = (T/T _{cr})	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39
23 Z (Table XI)	.949	.949	.956	.956	.960	.960	.966	.966