

WORKSHEET FOR CALCULATION OF ST. IC COLUMN WELLHEAD PRESSURE (P_w)

C-122D
Accepted 9-1-65

COMPANY Yates Petroleum Corp LEASE Millman HD State WELL NO. 2 DATE 4-13-78

LOCATION: Unit B Section 17 Township 19S Range 28E

L 11090 H 11090 L/H 1.000 G 0.785 % CO₂ 0.50 % N₂ 0.17 % H₂S N.I.
 $\frac{2.78 - 11032(3.98)}{52(18.24)} = 43907$
 $\frac{4.2 - 52(18.24)}{6(793)} = 951$
 $\frac{6.4 - 11090(4.04)}{48} = 44906$
 d 2.0122 F_i 0.017362 GH 8706 P_{Cr} 668 T_{Cr} 418.5
 TABLE IN B A
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LINE	S1	1	2	3	4	S1	1	2	3	4
1 Q _m	-	1572	2409	3478	4846	-	1572	2409	3478	4846
2 T _w (W.H. °R)	507	522	525	528	531					
3 T _s (B.H. °R)	625	624	623	622	621					
4 T = $\frac{(T_w + T_s)}{2}$	566	573	574	575	576		573	574	575	576
5 Z (Est.)	927	900	867	835	800		9015	8675	838	801
6 TZ	524.68	515.70	497.66	480.125	460.80		516.56	497.95	481.85	461.576
7 G _H TZ	16.593	16.882	17.494	18.133	18.893		16.5854	17.484	18.068	18.870
8 e ^s (Table XIV)	1.8631	1.8834	1.9271	1.9739	2.0309		1.8814	1.9264	1.9690	2.0291
9 1-e ^s (Table XIV)	-	0.4690	0.4811	0.4934	0.5076		0.4685	0.4809	0.4921	0.5072
10 F _i	4180.2	3961.2	3679.2	3428.2	3091.2		3961.2	3679.2	3428.2	3091.2
11 P _i $\frac{2}{1000}$	17474	15691.1	13536.5	11752.5	9555.5		15691.1	13536.5	11752.5	9555.5
12 F _i 1.1e-5 $\frac{2.78 - 11032(3.98)}{52(18.24)} = 43907$	162224	163308	165602	167999	170850		163202	165564	167754	170761
13 F _c = F _i TZ		8.9536	8.6404	8.336	8.000		8.9685	8.6454	8.3659	8.0104
14 F _c Q _m		14.075	20.81	28.992	38.77		14.098	20.827	29.097	38.818
15 L/H (F _c Q _m) ²		198.1	433.25	840.6	1503		198.77	433.76	846.6	1506.9
16 F _w = L/H (F _c Q _m) ² (1-e ^s)		92.9	208.4	414.7	763.0		93.1	208.6	416.6	764.3
17 P _w ² = P _i ² + F _w		15784.0	13744.9	12167.2	10318.5		15784.2	13745.1	12169.1	10319.8
18 P _s ² = e ^s P _w ²	32558	29727.6	26487.8	24016.9	20955.9		29696.4	26478.6	23961.0	20939.9
19 P _s	5706	5452.3	5146.6	4900.7	4577.8		5449.4	5145.7	4895.0	4576.0
20 P = $\frac{(P_i + P_s)}{2}$	4943	4706.8	4412.9	4164.4	3834.5		4705.3	4412.5	4161.6	3833.6
21 P _r = (P/P _{Cr})	7.40	7.046	6.606	6.234	5.740		7.044	6.605	6.230	5.739
22 T _r = (T/T _{Cr})	1.353	1.369	1.3715	1.374	1.376		1.369	1.3715	1.374	1.376
23 Z (Table XI)	1.927	1.9015	0.8675	0.838	0.801		0.9015	0.8675	0.838	0.801

$$g_{mix} = \frac{.646 + \frac{4595(.7525)}{20570}}{1 + \frac{777}{20570}} = \frac{181432}{103990} = .785$$

$$F_R = \frac{1.63294}{\frac{(15100 + 1.2147)5.9125}{16.3750}} = .017362$$