

WORK SHEET FOR STEPWISE CALCULATION

PRESSURE

(SURFACE)

XXXXXX

Form C-122-E

(P_c & P_w)

RATE #1

COMPANY Grace Petroleum Company LEASE Whitten Federal WELL NO. 1 DATE 9-4-79
 LOCATION: UNIT I SECTION 14 TOWNSHIP 20 S RANGE 34E
L 13090 H 13090 L/H 1.0 G .700 % CO₂ 0.23 % N₂ 0.60 % H₂S 0
d 2.441 F_r .010763 Q_m 1.003 M² cfd (L/H) (F_r Q_m)² P_{cr} 668 T_{cr} 392

| LINE | ITEM | SOURCE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|--|--------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---|----|
| 1 | H | | 13090 | 6545 | | | 0 | | | | | |
| 2 | GH | | 9163 | 4581 | | | 0 | | | | | |
| 3 | 37.5GH | | 343613 | 171807 | | | 0 | | | | | |
| 4 | P _c or P _n | | 3391.2 | 2870.6 | 2863.7 | 2857.3 | 2324.4 | 2310.3 | 2296.7 | 2300.3 | | |
| 5 | P _r | | 5.08 | 4.30 | 4.29 | 4.28 | 3.48 | 3.46 | 3.44 | 3.44 | | |
| 6 | T | | 647 | 588.5 | 588.5 | 588.5 | 530 | 530 | 530 | 530 | | |
| 7 | T _r | | 1.65 | 1.50 | 1.50 | 1.50 | 1.35 | 1.35 | 1.35 | 1.35 | | |
| 8 | Z | | .865 | .784 | .784 | .783 | .670 | .670 | .670 | .670 | | |
| 9 | P/Z P/Z | | 4 ÷ 8 | 3661.57 | 3652.79 | 3649.25 | 3469.29 | 3448.16 | 3428.02 | 3433.28 | | |
| 10 | P/TZ | | 9 ÷ 6 | 6.222 | 6.206 | 6.201 | 6.545 | 6.505 | 6.468 | 6.477 | | |
| 11 | (P/TZ) ² /1000 | | (10 ² /1000) | | | | | | | | | |
| 12 | L/H(F _r Q _m) ² | | | | | | | | | | | |
| 13 | 11 + 12 | | | | | | | | | | | |
| 14 | I _n | | 10 ÷ 13 | 160.723 | 161.109 | 161.266 | 152.768 | 153.705 | 154.608 | 154.371 | | |
| 15 | M = P _n - P _{n-1} | | | 520 | 527 | 534 | 533 | 547 | 561 | 557 | | |
| 16 | N = 1 + I _{n-1} | | | 330.063 | 325.754 | 321.832 | 322.375 | 314.034 | 306.473 | 308.313 | | |
| 17 | M x N | | 15 x 16 | | | 171858 | | | | 171730 | | |
| 18 | Σ (M x N) | | Σ 17 | | | 171858 | | | | 343588 | | |

delta P = $\frac{3(343613)}{165.031 + 4(161.266) + 154.371} = \frac{1030837}{964.466} = 1068.8$ P = 3391.2 - 1068.8 = 2322.4