

WORK SHEET FOR STEPWISE CALCULATION

PRESSURE  
(P<sub>c</sub> & P<sub>w</sub>)

Form C-122-E

RATE NO. 3

CLIENT: Monsanto Company LEASE: Cerf Federal WELL NO. 2 DATE: 10-20-76

SECTION: UNIT F SECTION 10 TOWNSHIP 21S RANGE 27E

10239 H 10239 L/H 1.00 G 0.793 % CO<sub>2</sub> 0.00 % N<sub>2</sub> 0.00 % H<sub>2</sub>S 0.00

d 1.995 F 0.018231 Q<sub>m</sub> 1.358 M<sup>2</sup> cfd (L/H) (F Q<sub>m</sub>)<sup>2</sup> 0.000613 P<sub>cr</sub> 666 T<sub>cr</sub> 421

| ITEM                                                 | SOURCE | 1                        | 2        | 3        | 4        | 5        | 6        | 7 | 8 | 9 | 10 |
|------------------------------------------------------|--------|--------------------------|----------|----------|----------|----------|----------|---|---|---|----|
| H                                                    |        | 0                        | 5120     |          | 10239    |          |          |   |   |   |    |
| GH                                                   |        | 0                        | 4060     |          | 8120     |          |          |   |   |   |    |
| 37.5GH                                               |        | 0                        | 152241   |          | 304482   |          |          |   |   |   |    |
| P <sub>c</sub> or P <sub>n</sub>                     |        | 2090.2                   | 2612.2   | 2607.2   | 3123.2   | 3115.2   |          |   |   |   |    |
| P <sub>r</sub>                                       |        | 3.14                     | 3.92     | 3.91     | 4.69     | 4.68     |          |   |   |   |    |
| P <sub>r</sub>                                       |        | 527                      | 577      | 571      | 614      | 614      |          |   |   |   |    |
| P <sub>r</sub>                                       |        | 1.25                     | 1.36     | 1.36     | 1.46     | 1.46     |          |   |   |   |    |
| P <sub>r</sub>                                       |        | 0.586                    | 0.690    | 0.689    | 0.777    | 0.776    |          |   |   |   |    |
| P/2 P/2                                              |        | 4 ÷ 8                    | 3566.89  | 3786.89  | 3784.03  | 4018.53  | 4013.40  |   |   |   |    |
| P/P <sub>r</sub>                                     |        | 9 ÷ 6                    | 6.7683   | 6.6379   | 6.6328   | 6.5448   | 6.5365   |   |   |   |    |
| (P/P <sub>r</sub> ) <sup>2</sup> / 1000              |        | (10 <sup>2</sup> / 1000) | 0.045810 | 0.044061 | 0.043995 | 0.042835 | 0.042726 |   |   |   |    |
| (L/H (P <sub>r</sub> Q <sub>m</sub> ) <sup>2</sup> ) |        |                          | 0.000613 | 0.000613 | 0.000613 | 0.000613 | 0.000613 |   |   |   |    |
| P <sub>n</sub>                                       |        | 11 + 12                  | 0.046423 | 0.044674 | 0.044608 | 0.043448 | 0.043339 |   |   |   |    |
| P <sub>n</sub>                                       |        | 10 ÷ 13                  | 145.797  | 148.584  | 148.693  | 150.637  | 150.824  |   |   |   |    |
| P <sub>n</sub>                                       |        |                          | 522      | 517      | 516      | 508      | 508      |   |   |   |    |
| P <sub>n</sub>                                       |        |                          | 294.381  | 294.490  | 299.330  | 299.517  |          |   |   |   |    |
| M x N                                                |        | 15 x 16                  |          |          |          |          |          |   |   |   |    |
| Σ (M x N)                                            |        | Σ 17                     |          |          |          |          |          |   |   |   |    |
|                                                      |        |                          | 152251   |          |          |          |          |   |   |   |    |
|                                                      |        |                          | 304406   |          |          |          |          |   |   |   |    |

$$\Delta P = \frac{3[304482]}{145.797 + 4[148.693] + 150.824} = \frac{913447}{891.393} = 1024.7 \quad P = 2090.2 + 1024.7 = 3114.9$$