



Well Intervention Pressure Control

Abbreviations used in this document

| | | |
|------------|---|--------------------------------|
| bbl/ft | = | Barrels (US) per foot |
| bbl/min | = | Barrels (US) per minute |
| bbl/stroke | = | Barrels (US) per stroke |
| BHP | = | Bottom Hole Pressure |
| ft | = | Feet |
| MD | = | Measured Depth |
| ppg | = | Pounds per gallon |
| psi | = | Pounds per square inch |
| psi/ft | = | Pound per square inch per foot |
| SIWHP | = | Shut in Well Head Pressure |
| TVD | = | True Vertical Depth |
| 0.052 | = | Constant factor |

1. PRESSURE GRADIENT (psi/ft)

$$\text{Fluid Density (ppg)} \times 0.052$$

2. FLUID DENSITY (ppg)

$$\text{Pressure (psi)} \div \text{TVD (ft)} \div 0.052$$

or

$$\frac{\text{Pressure (psi)}}{\text{TVD (ft)} \times 0.052}$$

3. HYDROSTATIC PRESSURE (psi)

$$\text{Fluid Density (ppg)} \times 0.052 \times \text{TVD (ft)}$$

or

$$\text{Pressure Gradient (psi/ft)} \times \text{TVD (ft)}$$

4. FORMATION PRESSURE (PSI)

$$\text{Hydrostatic Pressure (psi)} + \text{SIWHP (psi)}$$

5. TOTAL PRESSURE AT A GIVEN DEPTH IN A SHUT IN WELLBORE (psi)
(WHERE BHP = FORMATION PRESSURE)

$$\text{Hydrostatic Pressure of Gas (psi)} + \text{Hydrostatic Pressure of Oil (psi)} + \text{SIWHP (psi)}$$



6. TIME TO PUMP (minutes)

a. Tubing
$$\frac{\text{Tubing Capacity (bbl/ft)} \times \text{MD (ft)}}{\text{Pump Rate (bbl/min)}}$$

b. Annulus
$$\frac{\text{Annulus Capacity (bbl/ft)} \times \text{MD (ft)}}{\text{Pump Rate (bbl/min)}}$$

7. STROKES TO DISPLACE (Strokes)

a. Tubing
$$\frac{\text{Tubing Capacity (bbl/ft)} \times \text{MD (ft)}}{\text{Pump Displacement (bbl/stroke)}}$$

b. Annulus
$$\frac{\text{Annulus Capacity (bbl/ft)} \times \text{MD (ft)}}{\text{Pump Displacement (bbl/stroke)}}$$