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)
   Fluid Density (ppg) x 0.052

2. FLUID DENSITY (ppg)
   Pressure (psi) ÷ TVD (ft) ÷ 0.052
   or
   \[
   \frac{\text{Pressure (psi)}}{\text{TVD (ft) x 0.052}}
   \]

3. HYDROSTATIC PRESSURE (psi)
   Fluid Density (ppg) x 0.052 x TVD (ft)
   or
   Pressure Gradient (psi/ft) x TVD (ft)

4. FORMATION PRESSURE (PSI)
   Hydrostatic Pressure (psi) + SIWHP (psi)

5. TOTAL PRESSURE AT A GIVEN DEPTH IN A SHUT IN WELLBORE (psi)
   (WHERE BHP = FORMATION PRESSURE)
   Hydrostatic Pressure of Gas (psi) + Hydrostatic Pressure of Oil (psi) + 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  \[
   \frac{\text{Annulus Capacity (bbl/ft)} \times \text{MD (ft)}}{\text{Pump Displacement (bbl/stroke)}}
   \]