Constant rate production: qL = const

Lifting process at which liquid production rate stays constant over time along with pump settings $q_{LL}^{\uparrow}$:

(1) $$q_L^{\uparrow}(t) = q_{LL}^{\uparrow} = \text{const}$$

The usual lifting mechanism supporting this method is ESP and SRP.

In practice the constant rate production can only be maintained for wells with BHP p_{wf} being above critical value $p_{wf,c}$ at which pump is operational:

(2) $$p_{wf}(t) > p_{wf,c}$$

otherwise the pump stabilizes production at critical pressure $p_{wf,c}$:

(3) $$p_{wf}(t) = p_{wf,c}$$

and the actual liquid production rate starts declining linearly with formation pressure:

(4) $$q_L(t) = J \cdot (p_e(t) - p_{wf,c})$$

In case formation pressure in producer receives a support and gets high enough to make (4) estimation equal to original pump setting $q_{LL}^{\uparrow}$ then liquid production rate gets back to (1).

See Also

Petroleum Industry / Upstream / Subsurface E&P Disciplines / Well Testing (WT) / Flowrate Testing / Flowrate

[Well & Reservoir Surveillance]

[Surface flowrates] [Oil surface flowrate] [Gas surface flowrate] [Water surface flowrate]

[Constant pressure production: pwf = const]