Reservoir Engineering Data

JOHNSTON ...found a better way

Recorder No. J-529 Field Report No. 07274 C

Estimated Damage Ratio	EDR	STIMULATED		Effective Transmissibility OIL	$\frac{Kh}{\mu B}$	553.4	Md-ft. / Cp.
Maximum Reservoir Pressure FINAL SHUT-IN	P_o	3230	P.S.I.G.	Effective Transmissability	$\frac{Kh}{\mu B}$	-	Md-ft, / Cp.
Slope of Shut-in Curve CALCULATED	M	106	PSI/log cycle	Flow Rate OIL	Q	299	Bbl./day
Potentiometric Surface (Datum Plane, Sea Level)	PS	1082	ft.	Pressure Gradient		.312	PSI ft.
Productivity Index	PI	.143	Bbl./day/PSI	Gas Oil Ratio "M.F.E." SAMPLER	GOR	393	CF/Bbl.
Radius of Investigation		400	ft.	K (Effective to OIL)		43.0	Md.

Assumptions made for Calculations for Liquid Recoveries

1. Q is averaged at a constant rate.
2. P_f is formation flowing pressure at a constant rate.
3. Formation flow is taken as single phase flow.
   If gas is produced at surface, phase separation is assumed to have occurred in drill pipe.
4. Radial flow is assumed.
5. For the purpose of calculating EDR where specific reservoir parameters are not available it is assumed that:

Effective permeability, K, will fall between	1 to 200 md
Formation porosity, ϕ, will fall between	0.1 to 0.3
Fluid compressibility, c, will fall between	10^{-5} to 10^{-6}
Fluid viscosity, μ, will fall between	0.05 to 50 cp.
Well bore radius, r_w, will fall between	$3\frac{7}{8}$" to $4\frac{3}{8}$"

   Which gives an average value for the function log $\frac{K}{\phi\mu c r_w^2}$ of 5.5

6. Other standard radial flow, equilibrium assumptions.

Empirical Equations:

1. EDR $\frac{P_o - P_f}{M(\log T + 2.65)}$ where M $\frac{P_1 - P_{10}}{\text{Log Cycle}}$
2. Transmissibility $\frac{Kh}{\mu\beta} = \frac{162.6\,Q}{M}$
3. DST J $\frac{Q}{P_o - P_f}$ Theoretical J $\frac{7.08 \times 10^{-3}\,Kh}{\mu\beta \ln(r_e/r_w)}$ Assumed $\ln(r_e/r_w) = 7.60$
4. P.S. $\left[P_o \times 2.309 \text{ ft./PSI}\right] - \left[\text{Recorder depth to sea level.}\right]$
5. Radius of investigation, r_i $\sqrt{\frac{Kt}{40\phi\mu c}}$ where t time in days

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