Gas Reservoir Engineering Data

JOHNSTON ...found a better way

Instrument No. J-003 Field Report No. 07253 C

Estimated Damage Ratio	EDR	0.59		Effective Transmissibility GAS	$\frac{Kh}{\mu Z}$	15.65	Md-ft./Cp.
Maximum Reservoir Pressure FINAL SHUT-IN	P_o	4562	P.S.I.G.	Flow Rate GAS	Q_g	120	MCF/day
Slope of Shut-in Curve FINAL SHUT-IN	M_{g1}	7781408	PSI²/log cycle	Flow Rate	Q	-	
Potentiometric Surface (Datum Plane, Sea Level)	PS	-	ft.	Pressure Gradient		.4493	PSI/ft.
Radius of Investigation		11	ft.	K (Effective to GAS)		.026	Md.

SLOPE $M_{G1} = (4518)^2 - (3554)^2 = 7781408$ SLOPE $M_{G2} = (4562)^2 - (3423)^2 = 9094915$

Assumptions made for Calculations for Gas Recoveries

1. Q_g is taken as steady state flow and unless stated otherwise at standard conditions 14.7 P.S.I. and 60°F.
2. P_f is final formation flowing pressure at steady state flow.
3. Formation flow is taken as single phase flow. If liquid (condensate) is produced at surface, condensation is assumed to have occurred in drill pipe.
4. Radial flow is assumed.
5. Unless given, gas specific gravity is assumed to be 0.7 (air 1.0) and having pseudo critical temperature at 385° Rankin and pseudo critical pressure of 666 P.S.I.A.
6. Other standard radial flow, steady state assumptions.

K

Empirical Equations:

1. $EDR = \frac{P_o^2 - P_f^2}{M_g(\log T + 2.65)}$ where $M_g = \frac{P_1^2 - P_{10}^2}{\text{Log Cycle}}$

2. Transmissibility $\frac{Kh}{\mu Z} = \frac{1637°T_f Q_g}{M_g}$

3. P.S. = [$P_o \times 2.309$ ft./PSI] − [Recorder depth to sea level.]

4. Radius of Investigation, $r_i = \sqrt{\frac{Kt}{40\phi(1 - S_w)\mu c}}$ where t = time in days