

# Gas Reservoir Engineering Data



JOHNSTON

Instrument No. J-1916

Field Report No. 38267E

Damage Ratio	DR	2.21	Effective Transmissibility	$\frac{Kh}{\mu}$	26.99	$\frac{Md-ft.}{Cp.}$
Maximum Reservoir Pressure	P <sub>o</sub>	2300 P.S.I.A. EST.	Flow Rate	Q <sub>g</sub>	59	MCF day
Slope of Shut-in Curve	M <sub>g</sub>	749 PSI. log cycle	Flow Rate	Oil Q	14	BBL/DAY
Potentiometric Surface (Datum Plane, Sea Level)	PS	----- ft.	Pressure Gradient		.20	PSI/ft.
Radius of Investigation		2 ft.	K (Effective to Gas)		.00184	Md.

$$SLOPE (M) = 2033 - 1284 = 749 \text{ psi/Log Cycle}$$

## Assumptions made for Calculations for Gas Recoveries

1. Q<sub>g</sub> is taken as steady state flow and unless stated otherwise at standard conditions 14.7 P.S.I. and 60°F.
2. P<sub>i</sub> 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.

## Empirical Equations:

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

$$2. \text{Transmissibility } \frac{Kh}{\mu Z} = \frac{1637^\circ T_i Q_g}{M_g}$$

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

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

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