



CIRCULATING TIME

$$\text{Bottoms up time, min.} = \frac{\text{Annular Volume (Gal.)}}{\text{Pump Output, Gal./Min.}}$$

$$\text{Total Circulating Time, min.} = \frac{\text{Total Mud Volume (Gal.)}}{\text{Pump Output, Gal./Min.}}$$

$$\text{Circulating Time, Kelly to flowline, min.} = \frac{\text{Hole Volume (Gal.)} - \text{Drill Pipe Displacement (Gal.)}}{\text{Pump Output (Gal./Min.)}}$$

ANNULAR VELOCITY

By Multiplier:

$$\text{A.V., Ft./Min.} = \text{Pump Output (Gal./Min.)} \times (\text{Annular Velocity Multiplier})$$

$$= 336 (.436)$$

$$= 146 \text{ ft./min.}$$

Calculate the A.V.: Pump Output = 336 Gal./min.

Drill Pipe Size = 4"

Hole Size = 8"

By Formula:

$$\text{A.V., Ft./Min.} = \text{Pump Output, Gal./Min.} \times \left[\frac{24.5}{(\text{hole dia.})^2 - (\text{pipe dia.})^2} \right]$$

$$= 336 \left[\frac{24.5}{(8)^2 - (4)^2} \right]$$

$$= 146 \text{ ft./min.}$$

DF-6-2