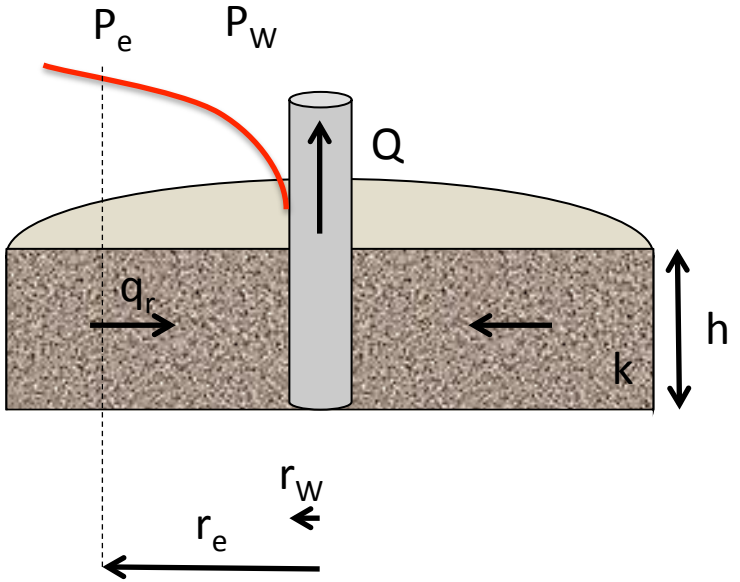
Intact



$$Q = -\frac{2\pi kh}{\mu}\frac{(P_e - P_W)}{p_D + s}$$

p_D: Dimensionless pressure

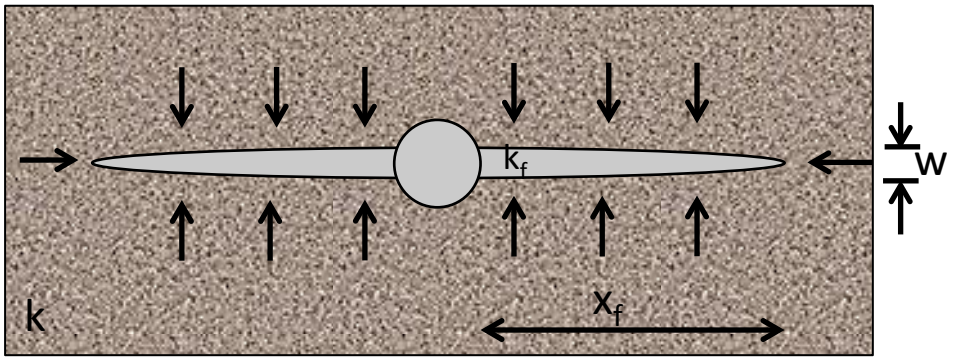
= ln (r_e/r_W) if steady state

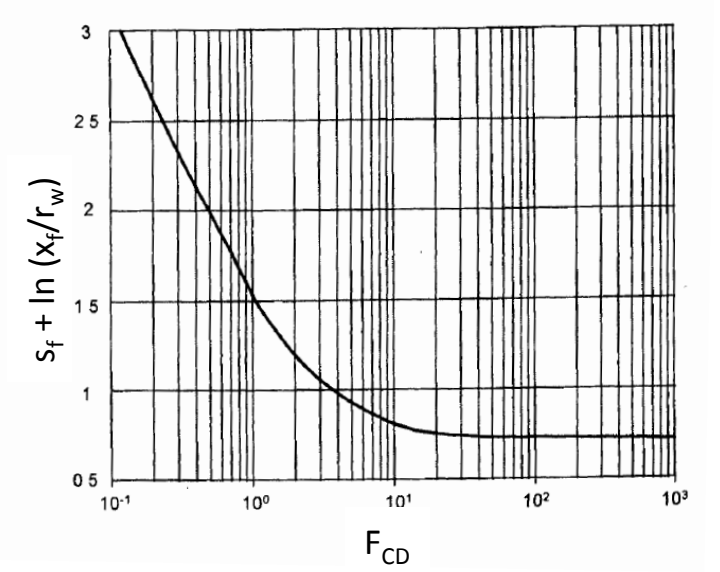
s: skin factor

> 1 → damage

< 1 → stimulation

Fractured





w, x_f, k_f → $F_{CD} = (k_f w)/(k\, x_f)$

x_f, r_W, F_{CD} → s_f from above plot