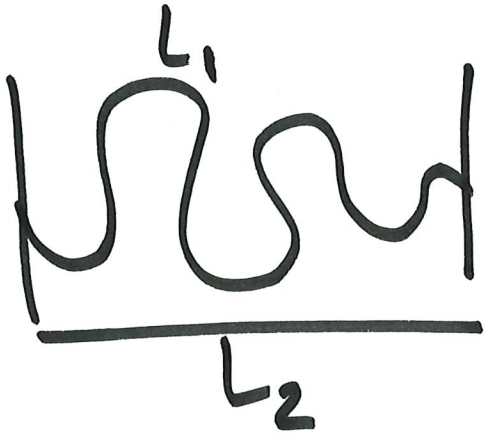
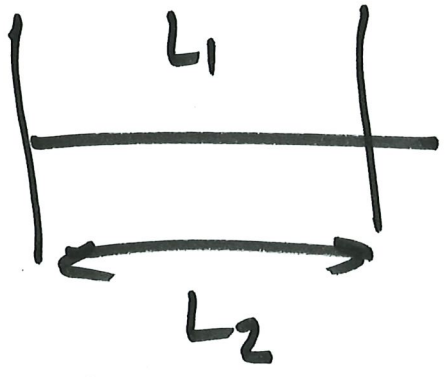
9/19/23

$$R_0 = \frac{R_W}{S} \rightarrow \Phi$$

$$R_0 = \frac{R_W}{\Phi}$$

$$\frac{R_0}{R_W} = F = \frac{1}{\Phi}$$





Example:

S_w at $D = X450$ ft (5)

$a = 1$, $m = 2$, $n = 2$

$R_w = 0.03\ \Omega.m$ @ $D = 5550$ ft

$T_s = 60\ ^\circ F$

$T_{BH} = 116\ ^\circ F$ @ $D_{BH} = 5647$ ft

T @ 5550 ft = 115.5 °F

T @ 5450 ft = 114.5 °F

$$R_t = R_w \frac{a}{\phi^m S_w^n} \rightarrow S_w = 27\%$$

20 ; R_w = 0.03 ; ϕ = 0.145

How to est R_w ?

$$R_t = R_w \frac{a}{\phi^m S_w^n}$$

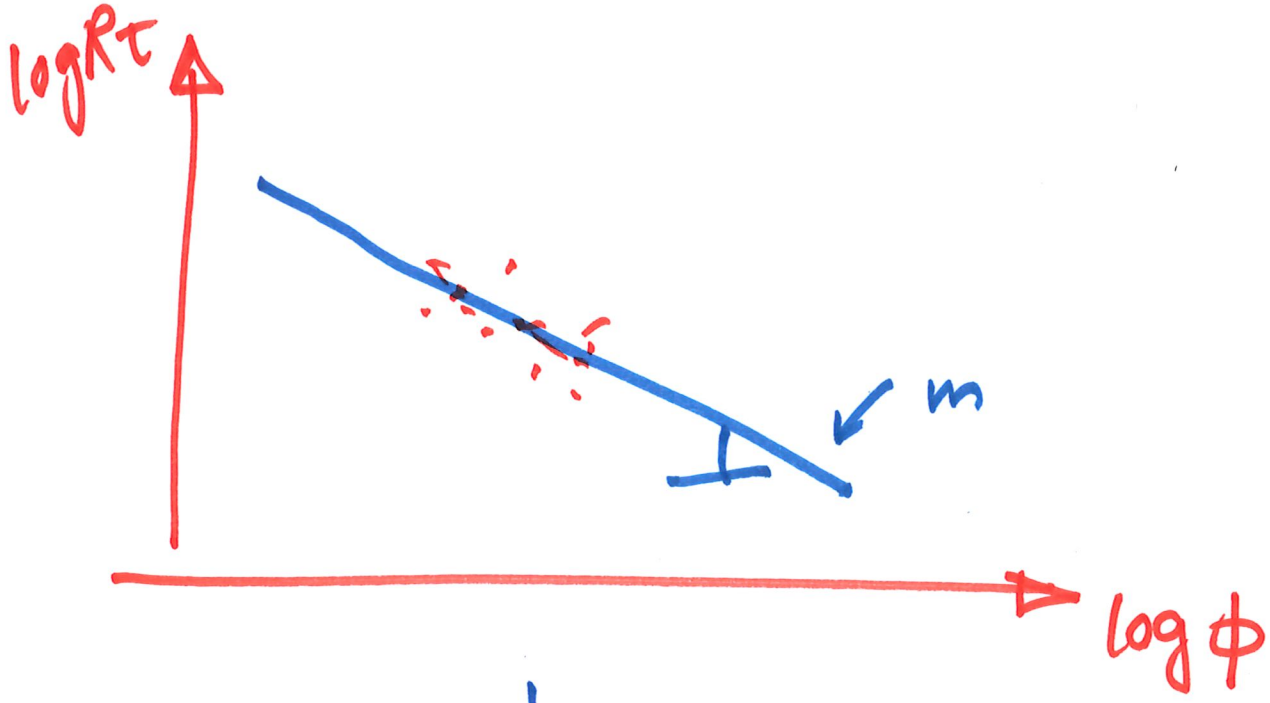
$$S_w = 100\%$$

$$\rightarrow R_t = R_w \frac{a}{\phi^m}$$

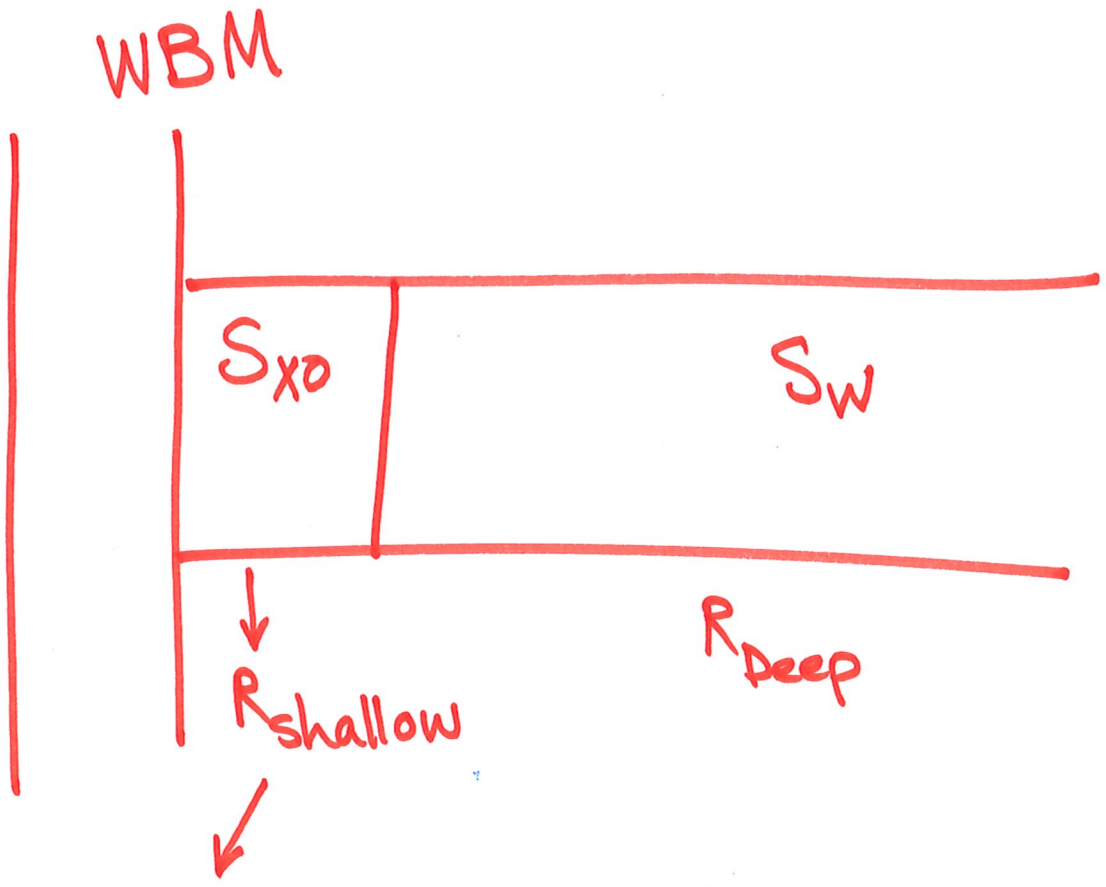
R_t : logs → R_w

$$\underbrace{\log R_t}_{Y} = \underbrace{\log R_w + \log a}_{A} - m \underbrace{\log \phi}_{X}$$

$$Y = A - mX$$



Rw , m



$$R_{shallow} = R_{mf} \frac{a}{\phi^m S_{xo}^n} \rightarrow S_{xo}$$

$$R_{Deep} = R_w \frac{a}{\phi^m S_w^n} \rightarrow S_w$$

$$S_{h,movable} = (1 - S_w) - (1 - S_{xo})$$

$$= S_{xo} - S_w$$