Sedimentation Class Example 2

Estimate the settling velocity of the floc particles that have an estimated density and size of:

$$\rho_p = 1{,}100 \ kg/m^3 \qquad\qquad d = 10^{-4} \ m$$

The density of water at 20^0C is 998 kg/m^3, the viscosity of water at 20^0C is $1.01(10^{-3})$ $N\text{-}s/m^2$ (Newton = $kg\text{-}m/s^2$), and gravity is 9.81 m/s^2.

$$v_p = v_s = OFR = \frac{(\rho_p - \rho_w)d^2 g}{18\mu}$$

Estimate the overflow rate [gpd/ft.^{2}]

$$OFR = \left(v_s \frac{cm}{s}\right)\left(\frac{cm^2}{cm^2}\right)\left(\frac{86{,}400 \ s}{day}\right)\left(\frac{1 \ gal}{3785.41 \ cm^3}\right)\left(\frac{30.48 \ cm}{1 \ ft}\right)^2$$