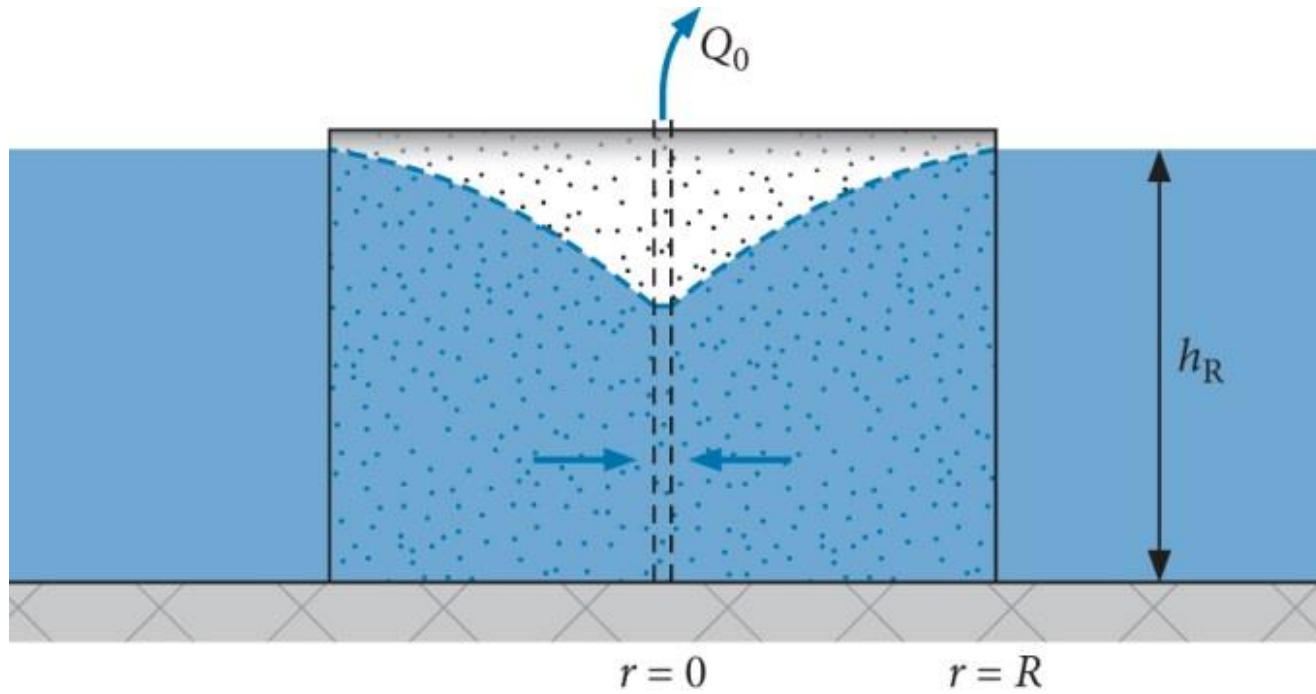


Unconfined aquifer

<https://www.youtube.com/user/MartinRHendriks/videos>



$$q_r = K \frac{dh}{dr}$$

$$Q_0 = q_r 2\pi r h$$

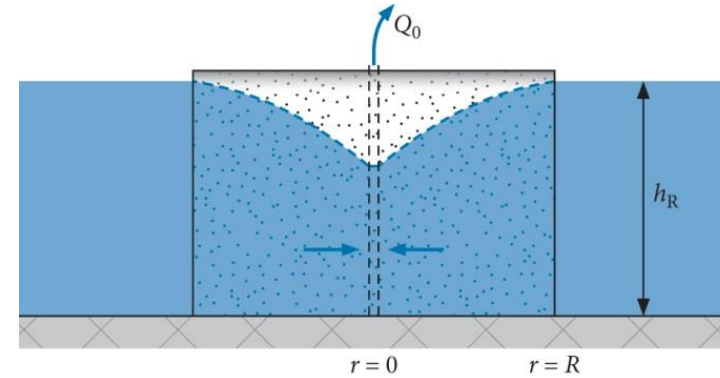
$$h^2 = h_R^2 + \frac{Q_0}{\pi K} \ln \frac{r}{R}$$

Unconfined aquifer

<https://www.youtube.com/user/MartinRHendriks/videos>

$$q_r = K \frac{dh}{dr}$$

$$Q_0 = q_r 2\pi r h$$



$$Q_0 = K \frac{dh}{dr} 2\pi r h \Rightarrow \frac{dh}{dr} = \frac{Q_0}{2\pi K h r} \Rightarrow \frac{Q_0}{r} dr = 2\pi K h dh \Rightarrow$$

$$\int \frac{Q_0}{r} dr = \int 2\pi K h dh \Rightarrow Q_0 \ln r = \pi K h^2 + C \Rightarrow h^2 = \frac{Q_0}{\pi K} \ln r + C$$

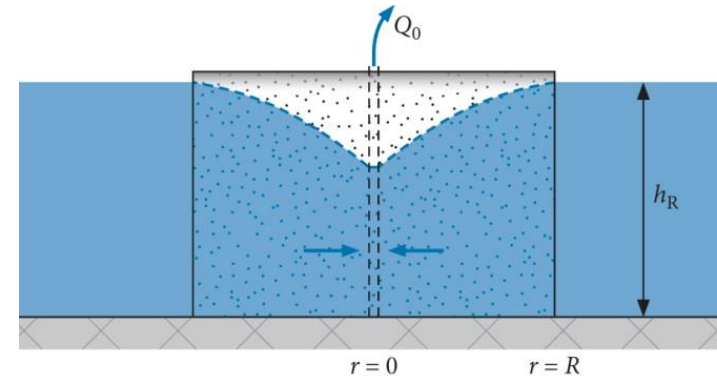
$$r = R \Rightarrow h^2 - h_R^2 = \frac{Q_0}{\pi K} \ln \frac{r}{R}$$

Unconfined aquifer

<https://www.youtube.com/user/MartinRHendriks/videos>

$$q_r = K \frac{dh}{dr}$$

$$Q_0 = q_r 2\pi r h$$



$$Q_0 = K \frac{dh}{dr} 2\pi r h \Rightarrow \frac{dh}{dr} = \frac{Q_0}{2\pi K h r} \Rightarrow \frac{Q_0}{r} dr = 2\pi K h dh \Rightarrow$$

$$\int \frac{Q_0}{r} dr = \int 2\pi K h dh \Rightarrow Q_0 \ln r = \pi K h^2 + C \Rightarrow h^2 = \frac{Q_0}{\pi K} \ln r + C$$

$$r = R \Rightarrow h^2 - h_R^2 = \frac{Q_0}{\pi K} \ln \frac{r}{R}$$

$$h^2 - h_R^2 = (h + h_R)(h - h_R) = 2\bar{D}(h - h_R) \Rightarrow h - h_R = \frac{Q_0}{2\pi K \bar{D}} \ln \frac{r}{R} \quad \text{Dupuit equation}$$