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# Confined Aquifer Formulas

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# List of 60 Confined Aquifer Formulas

## Confined Aquifer

### Aquifer Discharge

#### 1) Confined Aquifer Discharge given Coefficient of Transmissibility

Open Calculator

fx $$Q = \frac{2 \cdot \pi \cdot T_{envi} \cdot s_t}{\log\left(\left(\frac{R_w}{r}\right), e\right)}$$

ex $$1.07059 m^3/s = \frac{2 \cdot \pi \cdot 1.5 m^2/s \cdot 0.83 m}{\log\left(\left(\frac{8.6 m}{7.5 m}\right), e\right)}$$

#### 2) Confined Aquifer Discharge given Coefficient of Transmissibility and Depth of Water

Open Calculator

fx $$Q = \frac{2.72 \cdot T_w \cdot (h_2 - h_1)}{\log\left(\left(\frac{r_2}{r_1}\right), 10\right)}$$

ex $$1.02266 m^3/s = \frac{2.72 \cdot 26.9 m^2/s \cdot (17.8644 m - 17.85 m)}{\log\left(\left(\frac{10.0 m}{1.07 m}\right), 10\right)}$$

## 3) Confined Aquifer Discharge given Depth of Water in Two Wells

Open Calculator

$$Qcaq = \frac{2.72 \cdot K_w \cdot b_p \cdot (h_2 - h_1)}{\log\left(\left(\frac{r_2}{r_1}\right), 10\right)}$$

$$1.009354 m^3/s = \frac{2.72 \cdot 1125 cm/s \cdot 2.36m \cdot (17.8644m - 17.85m)}{\log\left(\left(\frac{10.0m}{1.07m}\right), 10\right)}$$

## 4) Confined Aquifer Discharge given Drawdown at Well

Open Calculator

$$Q = \frac{2 \cdot \pi \cdot K_{WH} \cdot b_p \cdot S_{tw}}{\log\left(\left(\frac{R_w}{r}\right), e\right)}$$

$$1.00049 m^3/s = \frac{2 \cdot \pi \cdot 10.00 cm/s \cdot 2.36m \cdot 4.93m}{\log\left(\left(\frac{8.6m}{7.5m}\right), e\right)}$$

## 5) Confined Aquifer Discharge with Base 10 given Coefficient of Transmissibility

Open Calculator

$$Q = \frac{2.72 \cdot T_{envi} \cdot S_{tw}}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}$$

$$1.195543 m^3/s = \frac{2.72 \cdot 1.5 m^2/s \cdot 4.93m}{\log\left(\left(\frac{8.6m}{7.5m}\right), 10\right)}$$

## 6) Confined Aquifer Discharge with Base 10 given Drawdown at Well

Open Calculator

fx $$Q = \frac{2.72 \cdot K_{WH} \cdot b_w \cdot S_{tw}}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}$$

ex $$1.127796 m^3/s = \frac{2.72 \cdot 10.00 cm/s \cdot 14.15m \cdot 4.93m}{\log\left(\left(\frac{8.6m}{7.5m}\right), 10\right)}$$

## 7) Discharge in Confined Aquifer

Open Calculator

fx $$Q_c = \frac{2 \cdot \pi \cdot K_{WH} \cdot b_w \cdot (H_i - h_w)}{\log\left(\left(\frac{R_w}{r}\right), e\right)}$$

ex $$0.048671 m^3/s = \frac{2 \cdot \pi \cdot 10.00 cm/s \cdot 14.15m \cdot (2.48m - 2.44m)}{\log\left(\left(\frac{8.6m}{7.5m}\right), e\right)}$$

## 8) Discharge in Confined Aquifer given Coefficient of Transmissibility

Open Calculator

fx $$Q_{ct} = \frac{2 \cdot \pi \cdot T_w \cdot (H_i - h_w)}{\log\left(\left(\frac{R_w}{r}\right), e\right)}$$

ex $$0.925265 m^3/s = \frac{2 \cdot \pi \cdot 26.9 m^2/s \cdot (2.48m - 2.44m)}{\log\left(\left(\frac{8.6m}{7.5m}\right), e\right)}$$

### 9) Discharge in Confined Aquifer with Base 10

Open Calculator

$$Q = \frac{2.72 \cdot K_w \cdot b_w \cdot (H_i - h_w)}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}$$

$$1.029428\text{m}^3/\text{s} = \frac{2.72 \cdot 1125\text{cm/s} \cdot 14.15\text{m} \cdot (2.48\text{m} - 2.44\text{m})}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), 10\right)}$$

### 10) Discharge in Confined Aquifer with Base 10 given Coefficient of Transmissibility

Open Calculator

$$Q_c = \frac{2.72 \cdot T_w \cdot (H_i - h_w)}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}$$

$$0.173956\text{m}^3/\text{s} = \frac{2.72 \cdot 26.9\text{m}^2/\text{s} \cdot (2.48\text{m} - 2.44\text{m})}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), 10\right)}$$

## Aquifer Thickness

### 11) Aquifer Thickness from Impermeable Layer given Coefficient of Transmissibility

Open Calculator

$$H_i = h_w + \left(\frac{Q \cdot \log\left(\left(\frac{R_w}{r}\right), e\right)}{2 \cdot \pi \cdot T_w}\right)$$

$$2.483663\text{m} = 2.44\text{m} + \left(\frac{1.01\text{m}^3/\text{s} \cdot \log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), e\right)}{2 \cdot \pi \cdot 26.9\text{m}^2/\text{s}}\right)$$

## 12) Aquifer Thickness from Impermeable Layer given Coefficient of Transmissibility with Base 10

Open Calculator

fx $$H_i = h_w + \left( \frac{Q \cdot \log\left( \left( \frac{R_w}{r} \right), 10 \right)}{2.72 \cdot T_w} \right)$$

ex $$2.672243\text{m} = 2.44\text{m} + \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{8.6\text{m}}{7.5\text{m}} \right), 10 \right)}{2.72 \cdot 26.9\text{m}^2/\text{s}} \right)$$

## 13) Aquifer Thickness from Impermeable Layer given Discharge in Confined Aquifer

Open Calculator

fx $$H_i = h_w + \left( \frac{Q \cdot \log\left( \left( \frac{R_w}{r} \right), e \right)}{2 \cdot \pi \cdot K_w \cdot b_w} \right)$$

ex $$2.447378\text{m} = 2.44\text{m} + \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{8.6\text{m}}{7.5\text{m}} \right), e \right)}{2 \cdot \pi \cdot 1125\text{cm/s} \cdot 14.15\text{m}} \right)$$

## 14) Aquifer Thickness from Impermeable Layer given Discharge in Confined Aquifer with Base 10

Open Calculator

fx $$H_i = h_w + \left( \frac{Q \cdot \log\left(\left(\frac{R_w}{r}\right), 10\right)}{2.72 \cdot K_w \cdot b_w} \right)$$

ex $$2.479245\text{m} = 2.44\text{m} + \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), 10\right)}{2.72 \cdot 1125\text{cm/s} \cdot 14.15\text{m}} \right)$$

## 15) Aquifer Thickness given Confined Aquifer Discharge

Open Calculator

fx $$b_w = \frac{Q}{\frac{2 \cdot \pi \cdot K_{WH} \cdot s_t}{\log\left(\left(\frac{R_w}{r}\right), e\right)}}$$

ex $$14.15108\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2 \cdot \pi \cdot 10.00\text{cm/s} \cdot 0.83\text{m}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), e\right)}}$$

## 16) Aquifer Thickness given Confined Aquifer Discharge with Base 10

Open Calculator

fx $$t_{aq} = \frac{Q}{\frac{2.72 \cdot K_w \cdot s_t}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}}$$

ex $$0.669058\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2.72 \cdot 1125\text{cm/s} \cdot 0.83\text{m}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), 10\right)}}$$

## 17) Aquifer Thickness given Depth of Water in Two Wells

Open Calculator

fx $$b_p = \frac{Q}{\frac{2.72 \cdot K_w \cdot (h_2 - h_1)}{\log\left(\left(\frac{r_2}{r_1}\right), 10\right)}}$$

ex $$2.361511\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2.72 \cdot 1125\text{cm/s} \cdot (17.8644\text{m} - 17.85\text{m})}{\log\left(\left(\frac{10.0\text{m}}{1.07\text{m}}\right), 10\right)}}$$

## 18) Thickness of Confined Aquifer given Discharge in Confined Aquifer

Open Calculator

fx $$b_p = \frac{Q}{\frac{2 \cdot \pi \cdot K_w \cdot (H_i - h_w)}{\log\left(\left(\frac{R_w}{r}\right), e\right)}}$$

ex $$2.610087\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2 \cdot \pi \cdot 1125\text{cm/s} \cdot (2.48\text{m} - 2.44\text{m})}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), e\right)}}$$

## 19) Thickness of Confined Aquifer given Discharge in Confined Aquifer with Base 10

Open Calculator

fx $$t_{aq} = \frac{Q_c}{\frac{2.72 \cdot K_{WH} \cdot (b_w - h_w)}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}}$$

ex $$0.211289\text{m} = \frac{0.04\text{m}^3/\text{s}}{\frac{2.72 \cdot 10.00\text{cm/s} \cdot (14.15\text{m} - 2.44\text{m})}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), 10\right)}}$$

# Coefficient of Permeability

## 20) Coefficient of Permeability given Confined Aquifer Discharge

Open Calculator

$$K_{WH} = \frac{Q}{\frac{2 \cdot \pi \cdot b_w \cdot s_t}{\log\left(\left(\frac{R_w}{r}\right), e\right)}}$$

$$10.00076\text{cm/s} = \frac{1.01\text{m}^3/\text{s}}{\frac{2 \cdot \pi \cdot 14.15\text{m} \cdot 0.83\text{m}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), e\right)}}$$

## 21) Coefficient of Permeability given Confined Aquifer Discharge with Base 10

Open Calculator

$$K_{WH} = \frac{Q}{\frac{2.72 \cdot b_w \cdot S_{tw}}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}}$$

$$8.955521\text{cm/s} = \frac{1.01\text{m}^3/\text{s}}{\frac{2.72 \cdot 14.15\text{m} \cdot 4.93\text{m}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), 10\right)}}$$

## 22) Coefficient of Permeability given Depth of Water in Two Wells

Open Calculator

$$K_w = \frac{Q}{\frac{2.72 \cdot b_p \cdot (h_2 - h_1)}{\log\left(\left(\frac{r_2}{r_1}\right), 10\right)}}$$

$$1125.72\text{cm/s} = \frac{1.01\text{m}^3/\text{s}}{\frac{2.72 \cdot 2.36\text{m} \cdot (17.8644\text{m} - 17.85\text{m})}{\log\left(\left(\frac{10.0\text{m}}{1.07\text{m}}\right), 10\right)}}$$

# Coefficient of Transmissibility

## 23) Coefficient of Transmissibility given Confined Aquifer Discharge

Open Calculator

$$T_{envi} = \frac{Q}{\frac{2 \cdot \pi \cdot s_t}{\log\left(\left(\frac{R_w}{r}\right), e\right)}}$$

$$1.415108 m^2/s = \frac{1.01 m^3/s}{\frac{2 \cdot \pi \cdot 0.83 m}{\log\left(\left(\frac{8.6 m}{7.5 m}\right), e\right)}}$$

## 24) Coefficient of Transmissibility given Depth of Water in Two Wells

Open Calculator

$$T_{envi} = \frac{Q}{\frac{2.72 \cdot (h_2 - h_1)}{\log\left(\left(\frac{r_2}{r1'}\right), 10\right)}}$$

$$2.578636 m^2/s = \frac{1.01 m^3/s}{\frac{2.72 \cdot (17.8644 m - 17.85 m)}{\log\left(\left(\frac{10.0 m}{0.000000001 m}\right), 10\right)}}$$

## 25) Coefficient of Transmissibility given Discharge in Confined Aquifer with Base 10

Open Calculator

$$T_{envi} = \frac{Q}{\frac{2.72 \cdot (b_w - h_{well})}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}}$$

$$1.50538 m^2/s = \frac{1.01 m^3/s}{\frac{2.72 \cdot (14.15 m - 10.000 m)}{\log\left(\left(\frac{8.6 m}{7.5 m}\right), 10\right)}}$$

# Depth of Water in Well

## 26) Depth of Water in 1st Well given Coefficient of Transmissibility

Open Calculator

fx $$h_1 = h_2 - \left( \frac{Q \cdot \log\left( \left( \frac{r_2}{r_1} \right), 10 \right)}{2.72 \cdot T_{envi}} \right)$$

ex $$17.60936\text{m} = 17.8644\text{m} - \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{10.0\text{m}}{1.07\text{m}} \right), 10 \right)}{2.72 \cdot 1.5\text{m}^2/\text{s}} \right)$$

## 27) Depth of Water in 1st Well given Confined Aquifer Discharge

Open Calculator

fx $$h_1 = h_2 - \left( \frac{Q \cdot \log\left( \left( \frac{r_2}{r_1} \right), 10 \right)}{2.72 \cdot K_{WH} \cdot b_p} \right)$$

ex $$16.24336\text{m} = 17.8644\text{m} - \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{10.0\text{m}}{1.07\text{m}} \right), 10 \right)}{2.72 \cdot 10.00\text{cm/s} \cdot 2.36\text{m}} \right)$$

## 28) Depth of Water in 2nd Well given Coefficient of Transmissibility

Open Calculator

fx $$h_2 = h_1 + \left( \frac{Q \cdot \log\left( \left( \frac{r_2}{r_1} \right), 10 \right)}{2.72 \cdot T_{envi}} \right)$$

ex $$18.10504\text{m} = 17.85\text{m} + \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{10.0\text{m}}{1.07\text{m}} \right), 10 \right)}{2.72 \cdot 1.5\text{m}^2/\text{s}} \right)$$

## 29) Depth of Water in 2nd Well given Confined Aquifer Discharge

Open Calculator

fx $$h_2 = h_1 + \left( \frac{Q \cdot \log\left( \left( \frac{r_2}{r_1} \right), 10 \right)}{2.72 \cdot K_{WH} \cdot b_p} \right)$$

ex $$19.47104\text{m} = 17.85\text{m} + \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{10.0\text{m}}{1.07\text{m}} \right), 10 \right)}{2.72 \cdot 10.00\text{cm/s} \cdot 2.36\text{m}} \right)$$

## 30) Depth of Water in Well given Coefficient of Transmissibility

Open Calculator

fx $$h_w = H_i - \left( \frac{Q \cdot \log\left( \left( \frac{R_w}{r} \right), e \right)}{2 \cdot \pi \cdot T_{envi}} \right)$$

ex $$1.696974\text{m} = 2.48\text{m} - \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{8.6\text{m}}{7.5\text{m}} \right), e \right)}{2 \cdot \pi \cdot 1.5\text{m}^2/\text{s}} \right)$$

## 31) Depth of Water in Well given Coefficient of Transmissibility with Base 10

Open Calculator

fx $$h_{well} = b_w - \left( \frac{Q \cdot \log\left( \left( \frac{R_w}{r} \right), 10 \right)}{2.72 \cdot T_{envi}} \right)$$

ex $$9.985116\text{m} = 14.15\text{m} - \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{8.6\text{m}}{7.5\text{m}} \right), 10 \right)}{2.72 \cdot 1.5\text{m}^2/\text{s}} \right)$$

## 32) Depth of Water in Well given Discharge in Confined Aquifer

Open Calculator

fx $$h_{well} = b_w - \left( \frac{Q \cdot \log\left( \left( \frac{R_w}{r} \right), e \right)}{2 \cdot \pi \cdot K_{WH} \cdot b_p} \right)$$

ex $$9.173138\text{m} = 14.15\text{m} - \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{8.6\text{m}}{7.5\text{m}} \right), e \right)}{2 \cdot \pi \cdot 10.00\text{cm/s} \cdot 2.36\text{m}} \right)$$

## 33) Depth of Water in Well given Discharge in Confined Aquifer with Base 10

Open Calculator

fx $$h_{well} = b_w - \left( \frac{Q \cdot \log\left( \left( \frac{R_w}{r} \right), 10 \right)}{2.72 \cdot K_w \cdot b_p} \right)$$

ex $$13.9147\text{m} = 14.15\text{m} - \left( \frac{1.01\text{m}^3/\text{s} \cdot \log\left( \left( \frac{8.6\text{m}}{7.5\text{m}} \right), 10 \right)}{2.72 \cdot 1125\text{cm/s} \cdot 2.36\text{m}} \right)$$

# Drawdown at well

## 34) Drawdown at Well given Coefficient of Transmissibility

Open Calculator

$$s_t = \frac{Q}{\frac{2 \cdot \pi \cdot T_{envi}}{\log\left(\left(\frac{R_w}{r}\right), e\right)}}$$

$$0.783026\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2 \cdot \pi \cdot 1.5\text{m}^2/\text{s}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), e\right)}}$$

## 35) Drawdown at Well given Coefficient of Transmissibility with Base 10

Open Calculator

$$S_{tw} = \frac{Q}{\frac{2.72 \cdot T_{envi}}{\log\left(\left(\frac{R_w}{r}\right), 10\right)}}$$

$$4.164884\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2.72 \cdot 1.5\text{m}^2/\text{s}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), 10\right)}}$$

## 36) Drawdown at Well given Confined Aquifer Discharge

Open Calculator

$$S_{tw} = \frac{Q}{\frac{2 \cdot \pi \cdot K_{WH} \cdot b_p}{\log\left(\left(\frac{R_w}{r}\right), e\right)}}$$

$$4.976862\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2 \cdot \pi \cdot 10.00\text{cm/s} \cdot 2.36\text{m}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right), e\right)}}$$

### 37) Drawdown at Well given Confined Aquifer Discharge with Base 10

Open Calculator

$$S_{tw} = \frac{Q}{\frac{2.72 \cdot K_{WH} \cdot b_w}{\log\left(\left(\frac{R_w}{r}\right),10\right)}}$$

$$4.415072\text{m} = \frac{1.01\text{m}^3/\text{s}}{\frac{2.72 \cdot 10.00\text{cm/s} \cdot 14.15\text{m}}{\log\left(\left(\frac{8.6\text{m}}{7.5\text{m}}\right),10\right)}}$$

## Radial Distance and Radius of well

### 38) Radial Distance of Well 1 given Coefficient of Transmissibility and Discharge

Open Calculator

$$R_1 = \frac{r_2}{10^{\frac{2.72 \cdot T_{envi} \cdot (h_2 - h_1)}{Q_0}}}$$

$$9.97298\text{m} = \frac{10.0\text{m}}{10^{\frac{2.72 \cdot 1.5\text{m}^2/\text{s} \cdot (17.8644\text{m} - 17.85\text{m})}{50\text{m}^3/\text{s}}}}$$

### 39) Radial Distance of Well 1 given Confined Aquifer Discharge

Open Calculator

$$R_1 = \frac{r_2}{10^{\frac{2.72 \cdot K_{WH} \cdot b_p \cdot (h_2 - h_1)}{Q_0}}}$$

$$9.995744\text{m} = \frac{10.0\text{m}}{10^{\frac{2.72 \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot (17.8644\text{m} - 17.85\text{m})}{50\text{m}^3/\text{s}}}}$$

## 40) Radial Distance of Well 2 given Coefficient of Transmissibility and Discharge

Open Calculator

$$R_2 = r_1 \cdot 10^{\frac{2.72 \cdot T_{envi} \cdot (h_2 - h_1)}{Q_0}}$$

$$1.072899\text{m} = 1.07\text{m} \cdot 10^{\frac{2.72 \cdot 1.5\text{m}^2/\text{s} \cdot (17.8644\text{m} - 17.85\text{m})}{50\text{m}^3/\text{s}}}$$

## 41) Radial Distance of Well 2 given Confined Aquifer Discharge

Open Calculator

$$R_2 = r_1 \cdot 10^{\frac{2.72 \cdot K_{WH} \cdot b_p \cdot (h_2 - h_1)}{Q_0}}$$

$$1.070456\text{m} = 1.07\text{m} \cdot 10^{\frac{2.72 \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot (17.8644\text{m} - 17.85\text{m})}{50\text{m}^3/\text{s}}}$$

## 42) Radius of Influence given Discharge and Length of Strainer

Open Calculator

$$R_w = r \cdot 10^{\frac{2.72 \cdot K_{WH} \cdot s_t \cdot \left(L + \left(\frac{s_t}{2}\right)\right)}{Q}}$$

$$25.99403\text{m} = 7.5\text{m} \cdot 10^{\frac{2.72 \cdot 10.00\text{cm/s} \cdot 0.83\text{m} \cdot \left(2\text{m} + \left(\frac{0.83\text{m}}{2}\right)\right)}{1.01\text{m}^3/\text{s}}}$$

## 43) Radius of Influence given Discharge in Unconfined Aquifer

Open Calculator

$$R_w = r \cdot \exp\left(\frac{\pi \cdot K_{soil} \cdot \left(H_i^2 - h_w^2\right)}{Q}\right)$$

$$7.500046\text{m} = 7.5\text{m} \cdot \exp\left(\frac{\pi \cdot 0.001\text{cm/s} \cdot \left((2.48\text{m})^2 - (2.44\text{m})^2\right)}{1.01\text{m}^3/\text{s}}\right)$$

## 44) Radius of Influence given Discharge in Unconfined Aquifer with Base 10

Open Calculator

**fx**
$$R_w = r \cdot 10^{\frac{1.36 \cdot K_{soil} \cdot \left(H_i^2 - h_w^2\right)}{Q}}$$

**ex**
$$7.500046\text{m} = 7.5\text{m} \cdot 10^{\frac{1.36 \cdot 0.001\text{cm/s} \cdot \left((2.48\text{m})^2 - (2.44\text{m})^2\right)}{1.01\text{m}^3/\text{s}}}$$

## 45) Radius of Well for Discharge in Confined Aquifer with Base 10

Open Calculator

**fx**
$$r_w = \frac{R_w}{10^{\frac{2.72 \cdot K_{swh} \cdot b \cdot (H_i - h_w)}{Q}}}$$

**ex**
$$8.67165\text{m} = \frac{8.6\text{m}}{10^{\frac{2.72 \cdot 0.0022 \cdot 3\text{m} \cdot (2.48\text{m} - 2.44\text{m})}{1.01\text{m}^3/\text{s}}}}$$

## 46) Radius of Well given Coefficient of Transmissibility

Open Calculator

**fx**
$$r_w = \frac{R_w}{\exp\left(\frac{2 \cdot \pi \cdot T_{envi} \cdot (H_i - h_w)}{Q_0}\right)}$$

**ex**
$$8.535401\text{m} = \frac{8.6\text{m}}{\exp\left(\frac{2 \cdot \pi \cdot 1.5\text{m}^2/\text{s} \cdot (2.48\text{m} - 2.44\text{m})}{50\text{m}^3/\text{s}}\right)}$$

## 47) Radius of Well given Coefficient of Transmissibility with Base 10

Open Calculator

fx $$r_w = \frac{R_w}{10^{\frac{2.72 \cdot T_{envi} \cdot (H_i - h_w)}{Q_0}}}$$

ex $$8.535608\text{m} = \frac{8.6\text{m}}{10^{\frac{2.72 \cdot 1.5\text{m}^2/\text{s} \cdot (2.48\text{m} - 2.44\text{m})}{50\text{m}^3/\text{s}}}}$$

## 48) Radius of Well given Confined Aquifer Discharge

Open Calculator

fx $$r' = \frac{R_w}{\exp\left(\frac{2 \cdot \pi \cdot K_{WH} \cdot b_p \cdot s_t}{Q}\right)}$$

ex $$2.542626\text{m} = \frac{8.6\text{m}}{\exp\left(\frac{2 \cdot \pi \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot 0.83\text{m}}{1.01\text{m}^3/\text{s}}\right)}$$

## 49) Radius of Well given Confined Aquifer Discharge with Base 10

Open Calculator

fx $$r' = \frac{R_w}{10^{\frac{2.72 \cdot K_{WH} \cdot b_p \cdot s_t}{Q}}}$$

ex $$2.552584\text{m} = \frac{8.6\text{m}}{10^{\frac{2.72 \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot 0.83\text{m}}{1.01\text{m}^3/\text{s}}}}$$

## 50) Radius of Well given Discharge in Confined Aquifer

Open Calculator

$$r_w = \frac{R_w}{\exp\left(\frac{2\cdot\pi\cdot K_{WH}\cdot b_p\cdot(H_i - h_w)}{Q_0}\right)}$$

$$8.589804\text{m} = \frac{8.6\text{m}}{\exp\left(\frac{2\cdot\pi\cdot 10.00\text{cm/s}\cdot 2.36\text{m}\cdot(2.48\text{m} - 2.44\text{m})}{50\text{m}^3/\text{s}}\right)}$$

## 51) Radius of Well given Drawdown at Well

Open Calculator

$$r'' = \frac{R_w}{\exp\left(\frac{2\cdot\pi\cdot T_{envi}\cdot s_t}{Q}\right)}$$

$$0.003723\text{m} = \frac{8.6\text{m}}{\exp\left(\frac{2\cdot\pi\cdot 1.5\text{m}^2/\text{s}\cdot 0.83\text{m}}{1.01\text{m}^3/\text{s}}\right)}$$

## 52) Radius of Well given Drawdown at Well with Base 10

Open Calculator

$$r'' = \frac{R_w}{10^{\frac{2.72\cdot T_{envi}\cdot s_t}{Q}}}$$

$$0.003816\text{m} = \frac{8.6\text{m}}{10^{\frac{2.72\cdot 1.5\text{m}^2/\text{s}\cdot 0.83\text{m}}{1.01\text{m}^3/\text{s}}}}$$

# Radius of Influence

## 53) Radius of Influence given Coefficient of Transmissibility

Open Calculator

$$r_{ic} = r \cdot \exp\left(\frac{2 \cdot \pi \cdot T_{envi} \cdot (H_i - h_w)}{Q_0}\right)$$

$$7.556762\text{m} = 7.5\text{m} \cdot \exp\left(\frac{2 \cdot \pi \cdot 1.5\text{m}^2/\text{s} \cdot (2.48\text{m} - 2.44\text{m})}{50\text{m}^3/\text{s}}\right)$$

## 54) Radius of Influence given Coefficient of Transmissibility with Base 10

Open Calculator

$$r_{ic} = r \cdot 10^{\frac{2.72 \cdot T_{envi} \cdot (H_i - h_w)}{Q_{li}}}$$

$$7.690264\text{m} = 7.5\text{m} \cdot 10^{\frac{2.72 \cdot 1.5\text{m}^2/\text{s} \cdot (2.48\text{m} - 2.44\text{m})}{15\text{m}^3/\text{s}}}$$

## 55) Radius of Influence given Confined Aquifer Discharge

Open Calculator

$$R_w = r \cdot \exp\left(\frac{2 \cdot \pi \cdot K_{WH} \cdot b_p \cdot s_t}{Q_{li}}\right)$$

$$8.141326\text{m} = 7.5\text{m} \cdot \exp\left(\frac{2 \cdot \pi \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot 0.83\text{m}}{15\text{m}^3/\text{s}}\right)$$

## 56) Radius of Influence given Confined Aquifer Discharge with Base 10

Open Calculator

$$R_w = r \cdot 10^{\frac{2.72 \cdot K_{WH} \cdot b_p \cdot s_t}{Q_{li}}}$$

$$8.139183\text{m} = 7.5\text{m} \cdot 10^{\frac{2.72 \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot 0.83\text{m}}{15\text{m}^3/\text{s}}}$$

## 57) Radius of Influence given Discharge in Confined Aquifer

Open Calculator

$$R_{id} = r \cdot \exp\left(\frac{2 \cdot \pi \cdot K_{WH} \cdot b_p \cdot (H_i - h_w)}{Q_0}\right)$$

ex

$$7.508902\text{m} = 7.5\text{m} \cdot \exp\left(\frac{2 \cdot \pi \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot (2.48\text{m} - 2.44\text{m})}{50\text{m}^3/\text{s}}\right)$$

## 58) Radius of Influence given Discharge in Confined Aquifer with Base 10

Open Calculator

$$R_{id} = r \cdot 10^{\frac{2.72 \cdot K_{WH} \cdot b_p \cdot (H_i - h_w)}{Q_0}}$$

ex

$$7.508874\text{m} = 7.5\text{m} \cdot 10^{\frac{2.72 \cdot 10.00\text{cm/s} \cdot 2.36\text{m} \cdot (2.48\text{m} - 2.44\text{m})}{50\text{m}^3/\text{s}}}$$

## 59) Radius of Influence given Drawdown at Well

Open Calculator

$$R_{iw} = r \cdot \exp\left(\frac{2 \cdot \pi \cdot T_{envi} \cdot s_t}{Q_{li}}\right)$$

ex

$$12.6342\text{m} = 7.5\text{m} \cdot \exp\left(\frac{2 \cdot \pi \cdot 1.5\text{m}^2/\text{s} \cdot 0.83\text{m}}{15\text{m}^3/\text{s}}\right)$$

## 60) Radius of Influence given Drawdown at Well with Base 10

Open Calculator

$$R_{iw} = r \cdot 10^{\frac{2.72 \cdot T_{envi} \cdot s_t}{Q_{li}}}$$

ex

$$12.61308\text{m} = 7.5\text{m} \cdot 10^{\frac{2.72 \cdot 1.5\text{m}^2/\text{s} \cdot 0.83\text{m}}{15\text{m}^3/\text{s}}}$$

## Variables Used

- **b** Thickness of Aquifer *(Meter)*
- **$b_p$** Aquifer Thickness During Pumping *(Meter)*
- **$b_w$** Aquifer Thickness *(Meter)*
- **$h_1$** Depth of Water 1 *(Meter)*
- **$h_2$** Depth of Water 2 *(Meter)*
- **$H_i$** Initial Aquifer Thickness *(Meter)*
- **$h_w$** Depth of Water *(Meter)*
- **$h_{well}$** Depth of Water in Well *(Meter)*
- **$K_{soil}$** Coefficient of Permeability of Soil Particle *(Centimeter per Second)*
- **$K_{swh}$** Standard Coefficient of Permeability
- **$K_w$** Coefficient of Permeability *(Centimeter per Second)*
- **$K_{WH}$** Coefficient of Permeability in Well Hydraulics *(Centimeter per Second)*
- **L** Length of Strainer *(Meter)*
- **Q** Discharge *(Cubic Meter per Second)*
- **$Q_0$** Discharge at Time t=0 *(Cubic Meter per Second)*
- **$Q_c$** Discharge in Confined Aquifer *(Cubic Meter per Second)*
- **$Q_{ct}$** Discharge given Coefficient of Transmissibility *(Cubic Meter per Second)*
- **$Q_{li}$** Discharge of Liquid *(Cubic Meter per Second)*
- **Qcaq** Confined Aquifer Discharge given Depth of Water *(Cubic Meter per Second)*

- **r** Radius of Well *(Meter)*
- $r_1$ Radial Distance at Observation Well 1 *(Meter)*
- $R_1$ Radial Distance 1 *(Meter)*
- $r_2$ Radial Distance at Observation Well 2 *(Meter)*
- $R_2$ Radial Distance at Well 2 *(Meter)*
- $r_{ic}$ Radius of Influence(Coeffi. of Transmissibility) *(Meter)*
- $R_{id}$ Radius of Influence given Discharge *(Meter)*
- $R_{iw}$ Radius of Influence given Drawdown at Well *(Meter)*
- $r_w$ Radius of Well given Discharge *(Meter)*
- $R_w$ Radius of Influence *(Meter)*
- $r'$ Radius of Well in Eviron. Engin. *(Meter)*
- $r''$ Radius of Well in Well Hydraulics *(Meter)*
- $r1'$ Radial Distance at Well 1 *(Meter)*
- $s_t$ Total Drawdown *(Meter)*
- $S_{tw}$ Total Drawdown in Well *(Meter)*
- $t_{aq}$ Aquifer Thickness given Confined Aquifer Discharge *(Meter)*
- $T_{envi}$ Coefficient of Transmissibility *(Square Meter per Second)*
- $T_w$ Coefficient of Transmissibility in Enviro. Eng. *(Square Meter per Second)*

# Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  *Archimedes' constant*
- Constant: **e**, 2.71828182845904523536028747135266249
  *Napier's constant*
- Function: **exp**, exp(Number)
  *n an exponential function, the value of the function changes by a constant factor for every unit change in the independent variable.*
- Function: **log**, log(Base, Number)
  *Logarithmic function is an inverse function to exponentiation.*
- Measurement: **Length** in Meter (m)
  *Length Unit Conversion*
- Measurement: **Speed** in Centimeter per Second (cm/s)
  *Speed Unit Conversion*
- Measurement: **Volumetric Flow Rate** in Cubic Meter per Second ($m^3/s$)
  *Volumetric Flow Rate Unit Conversion*
- Measurement: **Kinematic Viscosity** in Square Meter per Second ($m^2/s$)
  *Kinematic Viscosity Unit Conversion*

## Check other formula lists

- **Confined Aquifer Formulas**

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