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Open Wells Formulas

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List of 12 Open Wells Formulas

Open Wells

1) Depression Head for Flow Discharge into Well

$$\text{fx } H = \frac{Q_f}{K_0}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$\text{ex } 7.001167\text{m} = \frac{30.0\text{m}^3/\text{s}}{4.285}$$

2) Flow Discharge into Well

$$\text{fx } Q_f = K_0 \cdot H$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$\text{ex } 29.995\text{m}^3/\text{s} = 4.285 \cdot 7\text{m}$$

3) Proportionality Constant for Flow Discharge into Well

$$\text{fx } K_0 = \frac{Q_f}{H}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$\text{ex } 4.285714 = \frac{30.0\text{m}^3/\text{s}}{7\text{m}}$$



Recuperation Test

4) Area of Well given Specific Capacity per unit Well Area of Aquifer

$$\text{fx } A = \frac{K_0}{K_s}$$

[Open Calculator !\[\]\(a03a7eb2f4046e1d3c76772003e549ea_img.jpg\)](#)

$$\text{ex } 5.713333\text{m}^2 = \frac{4.285}{0.75}$$

5) Area of Well given Time Interval

$$\text{fx } A = K_0 \cdot \frac{T_r}{\ln\left(\frac{H_1}{H_2}\right)}$$

[Open Calculator !\[\]\(5361750c22c4e047a52f4eac1ec2d4cc_img.jpg\)](#)

$$\text{ex } 21.13622\text{m}^2 = 4.285 \cdot \frac{2\text{s}}{\ln\left(\frac{15.0\text{m}}{10.0\text{m}}\right)}$$

6) Area of Well when Discharged from Open Well is Considered

$$\text{fx } A = \frac{Q_Y}{K_s \cdot H}$$

[Open Calculator !\[\]\(b792654f2cef9719eabeb6c5be00811e_img.jpg\)](#)

$$\text{ex } 20\text{m}^2 = \frac{105\text{m}^3/\text{s}}{0.75 \cdot 7\text{m}}$$



7) Depression Head when Discharge from Open Well is Considered

$$fx \quad H = \frac{Q_Y}{K_s \cdot A}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$ex \quad 7m = \frac{105m^3/s}{0.75 \cdot 20m^2}$$

8) Discharge from Open Well under Depression Head

$$fx \quad Q_Y = K_s \cdot A \cdot H$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$ex \quad 105m^3/s = 0.75 \cdot 20m^2 \cdot 7m$$

9) Equation for Time Interval

$$fx \quad T_r = \left(\frac{A}{K_0} \right) \cdot \ln \left(\frac{H_1}{H_2} \right)$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

$$ex \quad 1.892486s = \left(\frac{20m^2}{4.285} \right) \cdot \ln \left(\frac{15.0m}{10.0m} \right)$$

10) Proportionality Constant given Specific Capacity per unit well Area of Aquifer

$$fx \quad K_0 = A \cdot K_s$$

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b_img.jpg\)](#)

$$ex \quad 15 = 20m^2 \cdot 0.75$$



11) Proportionality Constant per unit Well Area of Aquifer

$$\text{fx } K_0 = A \cdot \left(\left(\frac{1}{T_r} \right) \cdot \ln \left(\frac{H_1}{H_2} \right) \right)$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$\text{ex } 4.054651 = 20\text{m}^2 \cdot \left(\left(\frac{1}{2\text{s}} \right) \cdot \ln \left(\frac{15.0\text{m}}{10.0\text{m}} \right) \right)$$

12) Specific Capacity per unit Well Area for Discharge from Open Well

$$\text{fx } K_s = \frac{Q_f}{A \cdot H}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$\text{ex } 0.214286 = \frac{30.0\text{m}^3/\text{s}}{20\text{m}^2 \cdot 7\text{m}}$$







Variables Used

- **A** Area of the Well (Square Meter)
- **H** Depression Head (Meter)
- **H₁** Drawdown at the Start of Recuperation (Meter)
- **H₂** Drawdown at a Time (Meter)
- **K₀** Proportionality Constant
- **K_s** Specific Capacity
- **Q_f** Flow Discharge (Cubic Meter per Second)
- **Q_Y** Yield from an Open Well (Cubic Meter per Second)
- **T_r** Time Interval (Second)



Constants, Functions, Measurements used

- **Function:** **ln**, $\ln(\text{Number})$
The natural logarithm, also known as the logarithm to the base e, is the inverse function of the natural exponential function.
- **Measurement:** **Length** in Meter (m)
Length Unit Conversion 
- **Measurement:** **Time** in Second (s)
Time Unit Conversion 
- **Measurement:** **Area** in Square Meter (m^2)
Area Unit Conversion 
- **Measurement:** **Volumetric Flow Rate** in Cubic Meter per Second (m^3/s)
Volumetric Flow Rate Unit Conversion 



Check other formula lists

- [Aquifer Analysis and Properties Formulas](#) 
- [Coefficient of Permeability Formulas](#) 
- [Distance-Drawdown Analysis Formulas](#) 
- [Open Wells Formulas](#) 
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