



Groundwater Level Fluctuation Formulas

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List of 21 Groundwater Level Fluctuation Formulas

Groundwater Level Fluctuation

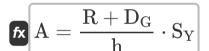
1) Base Flow when Possible Recharge is Considered



Open Calculator

 $= 5 m^3/s = 45 m^3/s - 70 m^3/s + 12 m^3/s + 18 m^3/s$

2) Catchment Area usually Watershed Area when Possible Recharge is Considered



Open Calculator

 $oxed{egin{aligned} egin{aligned} \mathbf{ex} \ 9.44 \mathrm{m}^2 &= \ rac{70 \mathrm{m}^3 / \mathrm{s} + 10 \mathrm{m}^3 / \mathrm{s}}{5 \mathrm{m}} \cdot 0.59 \end{aligned}}$

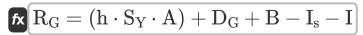
3) Equation for Base Flow into Stream from Area

$$oldsymbol{\mathbb{E}} \left[\mathrm{B} = \mathrm{R}_{\mathrm{G}} - \mathrm{D}_{\mathrm{G}} + \mathrm{I}_{\mathrm{s}} + \mathrm{I} - (\mathrm{h} \cdot \mathrm{S}_{\mathrm{Y}} \cdot \mathrm{A})
ight]$$

Open Calculator 🗗

 $6 ext{m}^3/ ext{s} = 45 ext{m}^3/ ext{s} - 10 ext{m}^3/ ext{s} + 18 ext{m}^3/ ext{s} + 12 ext{m}^3/ ext{s} - (5 ext{m} \cdot 0.59 \cdot 20 ext{m}^2)$

4) Equation for Gross Recharge due to Rainfall and other Sources



Open Calculator

 $45 ext{m}^3/ ext{s} = (5 ext{m} \cdot 0.59 \cdot 20 ext{m}^2) + 10 ext{m}^3/ ext{s} + 6 ext{m}^3/ ext{s} - 18 ext{m}^3/ ext{s} - 12 ext{m}^3/ ext{s}$



5) Equation for Gross Water Draft 🗗

 $\left| \mathbf{E} \right| \mathbf{D}_{\mathrm{G}} = \mathbf{R}_{\mathrm{G}} - \mathbf{B} + \mathbf{I}_{\mathrm{s}} + \mathbf{I} - (\mathbf{h} \cdot \mathbf{S}_{\mathrm{Y}} \cdot \mathbf{A})$

Open Calculator

ex $10 \mathrm{m}^3/\mathrm{s} = 45 \mathrm{m}^3/\mathrm{s} - 6 \mathrm{m}^3/\mathrm{s} + 18 \mathrm{m}^3/\mathrm{s} + 12 \mathrm{m}^3/\mathrm{s} - (5 \mathrm{m} \cdot 0.59 \cdot 20 \mathrm{m}^2)$

6) Equation for Net Ground Water Flow into Area across Boundary 🗗

ex $12 \mathrm{m}^3/\mathrm{s} = (5\mathrm{m} \cdot 0.59 \cdot 20\mathrm{m}^2) - 45\mathrm{m}^3/\mathrm{s} + 10\mathrm{m}^3/\mathrm{s} + 6\mathrm{m}^3/\mathrm{s} - 18\mathrm{m}^3/\mathrm{s}$

7) Equation for Recharge from Irrigation in Area

 $I = (ext{h} \cdot ext{S}_{ ext{Y}} \cdot ext{A}) - ext{R}_{ ext{G}} + ext{D}_{ ext{G}} + ext{B} - ext{I}_{ ext{s}}$

fx $m R_{
m gw} = R - R_{
m rf} - R_{
m wt} - R_{
m t}$

Open Calculator

Open Calculator

ex $19 \text{m}^3/\text{s} = 70 \text{m}^3/\text{s} - 16 \text{m}^3/\text{s} - 21 \text{m}^3/\text{s} - 14 \text{m}^3/\text{s}$

8) Equation for Recharge from Rainfall

fx $m R_{rf} = R - R_{gw} - R_{wt} - R_{t}$

Open Calculator 🚰

ex $16 \text{m}^3/\text{s} = 70 \text{m}^3/\text{s} - 19 \text{m}^3/\text{s} - 21 \text{m}^3/\text{s} - 14 \text{m}^3/\text{s}$

9) Equation for Recharge from Stream into Ground Water Body 🗗

 $[\mathbf{I}_{\mathrm{s}}] = (\mathbf{h} \cdot \mathbf{A} \cdot \mathbf{S}_{\mathrm{Y}}) - \mathbf{R}_{\mathrm{G}} + \mathbf{D}_{\mathrm{G}} + \mathbf{B} - \mathbf{I}$

Open Calculator

ex $18 \mathrm{m}^3/\mathrm{s} = (5\mathrm{m} \cdot 20\mathrm{m}^2 \cdot 0.59) - 45\mathrm{m}^3/\mathrm{s} + 10\mathrm{m}^3/\mathrm{s} + 6\mathrm{m}^3/\mathrm{s} - 12\mathrm{m}^3/\mathrm{s}$



10) Equation for Recharge from Tanks and Ponds

fx $R_{
m t}=R-R_{
m rf}-R_{
m ow}-R_{
m wt}$

fx $R_{
m wt} = R - R_{
m rf} - R_{
m ow} - R_{
m t}$

Open Calculator

Open Calculator 2

Open Calculator

Open Calculator 2

 $= 14 \text{m}^3/\text{s} = 70 \text{m}^3/\text{s} - 16 \text{m}^3/\text{s} - 19 \text{m}^3/\text{s} - 21 \text{m}^3/\text{s}$

11) Equation for Recharge from Water Conservation Structures



ex $21 \text{m}^3/\text{s} = 70 \text{m}^3/\text{s} - 16 \text{m}^3/\text{s} - 19 \text{m}^3/\text{s} - 14 \text{m}^3/\text{s}$

12) Equation for Recharge when Gross Water Draft is Considered



ex $49 \text{m}^3/\text{s} = (5 \text{m} \cdot 0.59 \cdot 20 \text{m}^2) - 10 \text{m}^3/\text{s}$

13) Equation for Specific Yield 6

 $\mathbf{S}_{\mathrm{Y}} = rac{\mathrm{R}_{\mathrm{G}} - \mathrm{D}_{\mathrm{G}} - \mathrm{B} + \mathrm{I}_{\mathrm{s}} + \mathrm{I}_{\mathrm{s}}}{\mathbf{A} \cdot \mathbf{h}}$

 $0.59 = rac{45 ext{m}^3/ ext{s} - 10 ext{m}^3/ ext{s} - 6 ext{m}^3/ ext{s} + 18 ext{m}^3/ ext{s} + 12 ext{m}^3/ ext{s}}{45 ext{m}^3/ ext{s} + 12 ext{m}^3/ ext{s}}$ $20m^2 \cdot 5m$



14) Equation for Water Level Fluctuation

 $h = rac{\mathrm{R_G} - \mathrm{D_G} - \mathrm{B} + \mathrm{I_s} + \mathrm{I}}{\mathrm{A} \cdot \mathrm{S_Y}}$

Open Calculator

 $ext{ex} = rac{45 ext{m}^3/ ext{s} - 10 ext{m}^3/ ext{s} - 6 ext{m}^3/ ext{s} + 18 ext{m}^3/ ext{s} + 12 ext{m}^3/ ext{s}}{20 ext{m}^2 \cdot 0.59}$

15) Equation for Watershed Area about Specific Yield and Water Level Fluctuation

 $\mathbf{A} = rac{\mathrm{R_G} - \mathrm{D_G} - \mathrm{B} + \mathrm{I_s} + \mathrm{I}}{\mathrm{S_Y} \cdot \mathrm{h}}$

Open Calculator 🚰

 $oxed{20 m^2 = rac{45 m^3/s - 10 m^3/s - 6 m^3/s + 18 m^3/s + 12 m^3/s}{0.59 \cdot 5 m}}$

16) Net Ground Water Flow given Possible Recharge

fx $I = R - R_G + B - I_s$

Open Calculator 🖸

 $= 13 ext{m}^3/ ext{s} = 70 ext{m}^3/ ext{s} - 45 ext{m}^3/ ext{s} + 6 ext{m}^3/ ext{s} - 18 ext{m}^3/ ext{s}$

17) Possible Recharge given Gross Recharge due to Rainfall

fx $m R = R_G - B + I + I_s$

Open Calculator 🗗

 $69 \mathrm{m}^3/\mathrm{s} = 45 \mathrm{m}^3/\mathrm{s} - 6 \mathrm{m}^3/\mathrm{s} + 12 \mathrm{m}^3/\mathrm{s} + 18 \mathrm{m}^3/\mathrm{s}$



18) Possible Recharge given other Recharge Factors

 $R = R_{
m rf} + R_{
m gw} + R_{
m wt} + R_{
m t}$

Open Calculator

 $= 70 \mathrm{m}^3/\mathrm{s} = 16 \mathrm{m}^3/\mathrm{s} + 19 \mathrm{m}^3/\mathrm{s} + 21 \mathrm{m}^3/\mathrm{s} + 14 \mathrm{m}^3/\mathrm{s}$

19) Recharge from Stream into Ground water Body given Possible Recharge

fx $I_{\rm s}=R-R_{\rm G}+B-I$

Open Calculator 🗗

 $m ex[19m^3/s=70m^3/s-45m^3/s+6m^3/s-12m^3/s]$

20) Specific Yield when Possible Recharge and Gross Water Draft is Considered

 $\mathbf{E} \mathbf{S}_{\mathrm{Y}} = rac{\mathrm{R} + \mathrm{D}_{\mathrm{G}}}{\mathrm{h} \cdot \mathrm{A}}$

Open Calculator 🗗

 $oxed{ex} 0.8 = rac{70 {
m m}^3/{
m s} + 10 {
m m}^3/{
m s}}{5 {
m m} \cdot 20 {
m m}^2}$

21) Water Level Fluctuation when Possible Recharge and Gross Water Draft is Considered

 $h = rac{R + D_G}{S_V \cdot A}$

Open Calculator

$$ext{ex} 6.779661 ext{m} = rac{70 ext{m}^3/ ext{s} + 10 ext{m}^3/ ext{s}}{0.59 \cdot 20 ext{m}^2}$$





Variables Used

- A Watershed Area (Square Meter)
- B Base Flow into the Stream from the Area (Cubic Meter per Second)
- D_G Gross Water Draft (Cubic Meter per Second)
- **h** Water Level Fluctuation (Meter)
- I Net Ground Water Flowing Outside Catchment (Cubic Meter per Second)
- I_s Recharge of Ground Water Body (Cubic Meter per Second)
- R Possible Recharge (Cubic Meter per Second)
- RG Gross Recharge due to Rainfall (Cubic Meter per Second)
- R_{qw} Recharge from Irrigation (Cubic Meter per Second)
- R_{rf} Recharge from Rainfall (Cubic Meter per Second)
- Rt Recharge from Tanks and Ponds (Cubic Meter per Second)
- Rwt Recharge from Conservation Structures (Cubic Meter per Second)
- S_Y Specific Yield





Constants, Functions, Measurements used

- Measurement: Length in Meter (m)

 Length Unit Conversion
- Measurement: Area in Square Meter (m²)

 Area Unit Conversion
- Measurement: Volumetric Flow Rate in Cubic Meter per Second (m³/s)

 Volumetric Flow Rate Unit Conversion





Check other formula lists

- Groundwater Level Fluctuation Specific Yield Method Formulas **Rainfall Infiltration Method**
 - Formulas

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Formulas C

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