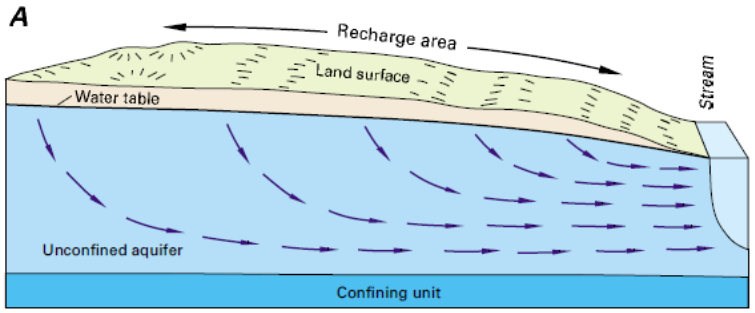
GROUNDWATER RESOURCE DIRECTED MEASURES

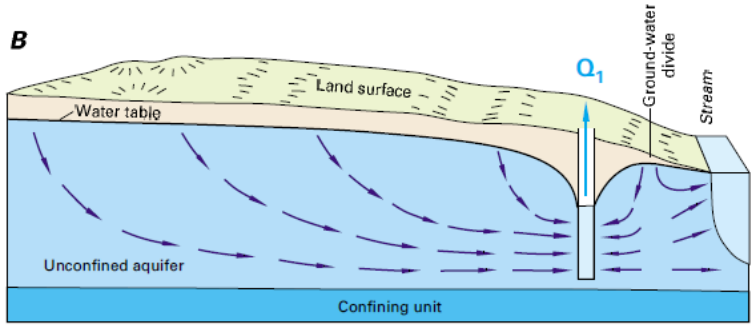
Aquifer Model

Yield Model States



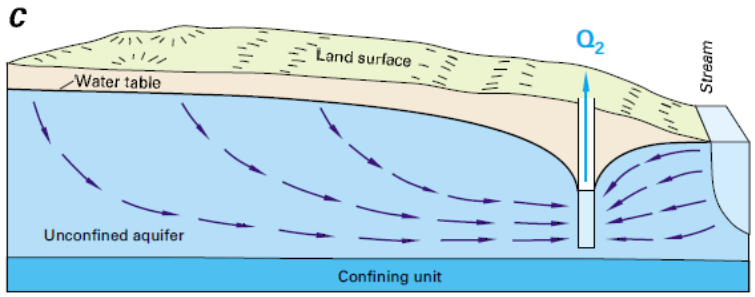
Scenario A (Ambient State):

Under natural conditions recharge at the water table is equal to discharge to the stream.



Scenario B (Steady State):

Inflow to the groundwater system from recharge will equal outflow to the stream plus the abstraction from the borehole.

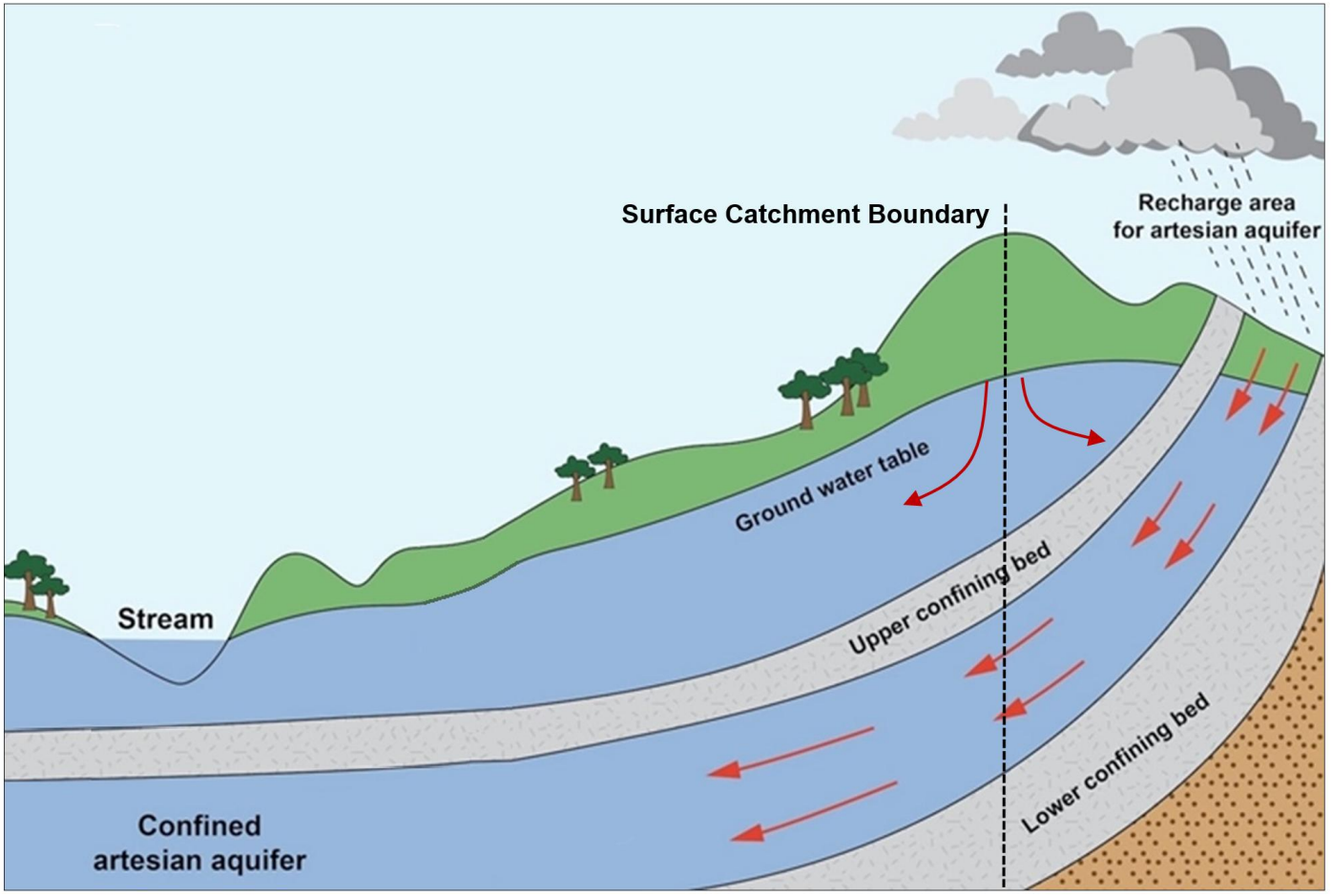


Scenario C (Transient State):

Baseflow component consumed by high pumping rate.

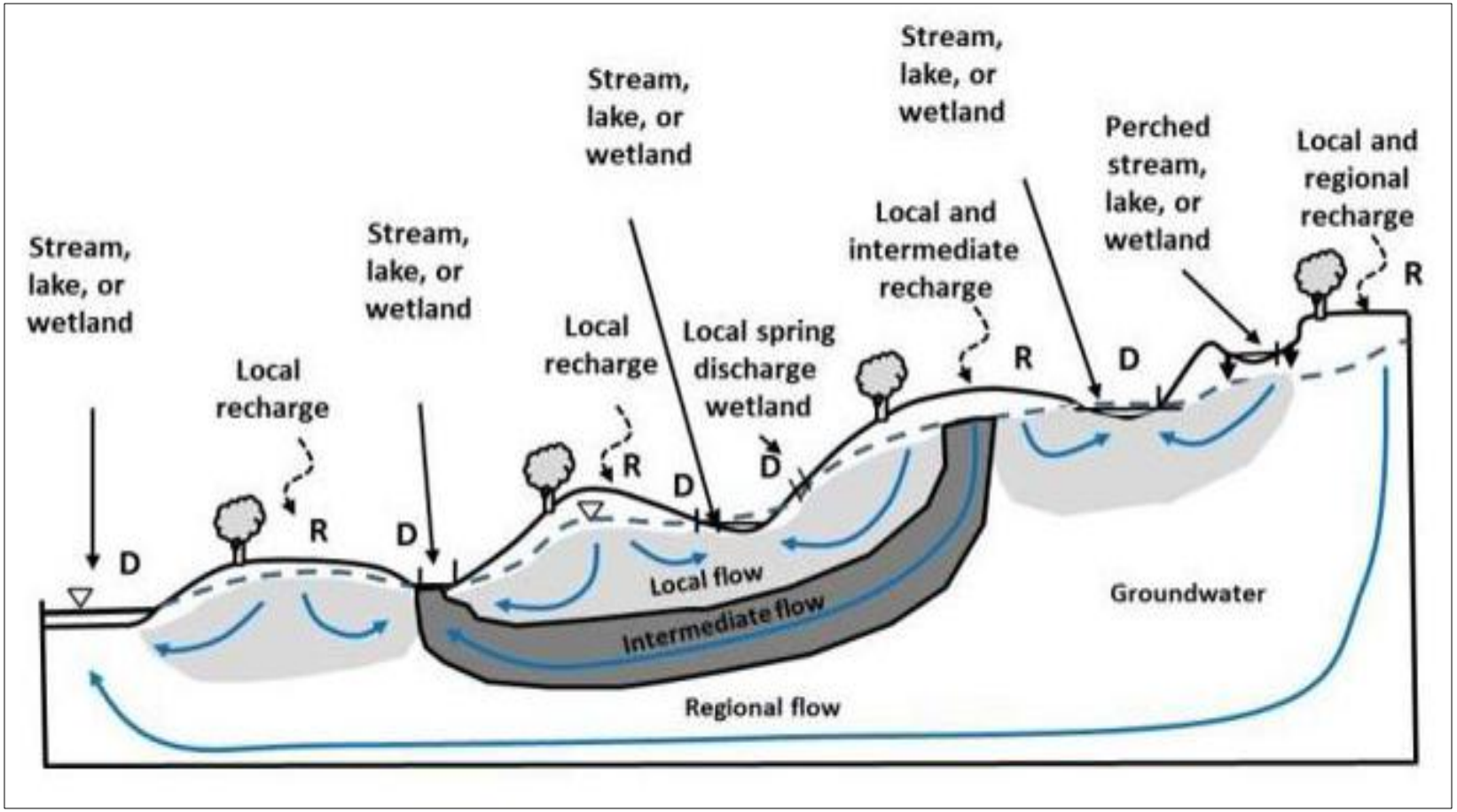


Calculating the Reserve (Version 3)



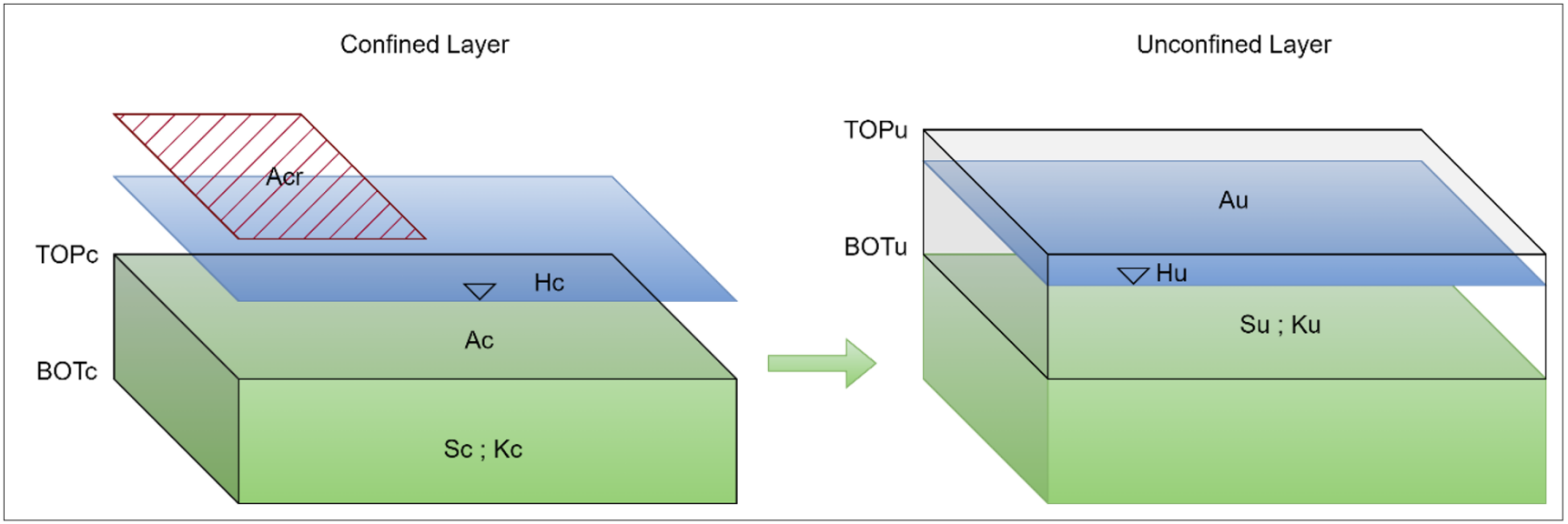


Local and Regional Flow





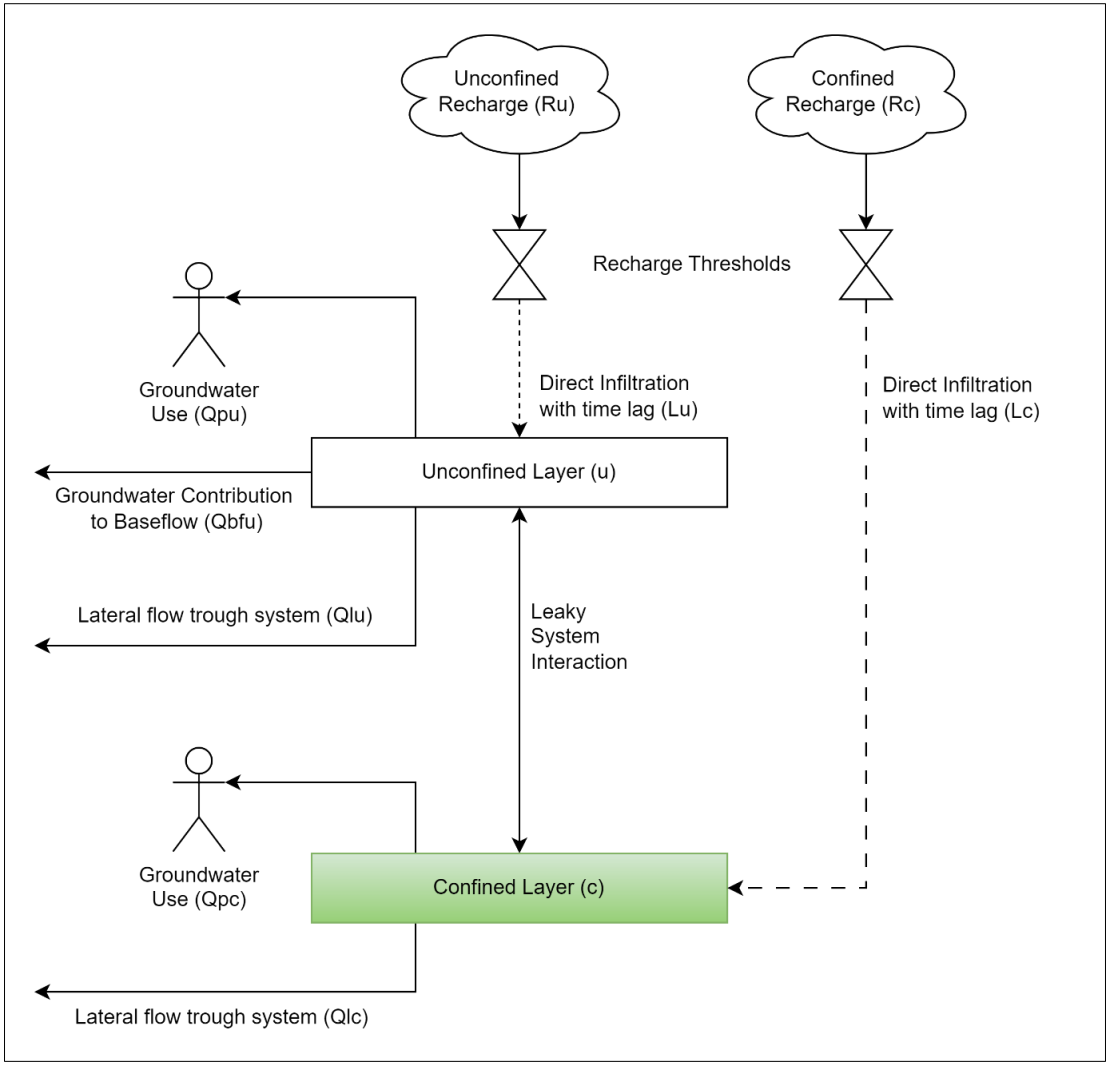
Conceptual Model



Parameter	Description
A_u , A_c	Area of layer u and c respectively [L^2]
A_{cr}	Recharge area associated with the confined system [L^2]
H_u , H_c	Head value of layer u and c respectively [L]
S_u , S_c	Storativity of layer u and c respectively
K_u , K_c	Hydraulic Conductivity of layer u and c respectively [L/T]
TOP_u , TOP_c	Top of layer u and c respectively [L]
BOT_u , BOT_c	Bottom of layer u and c respectively [L]

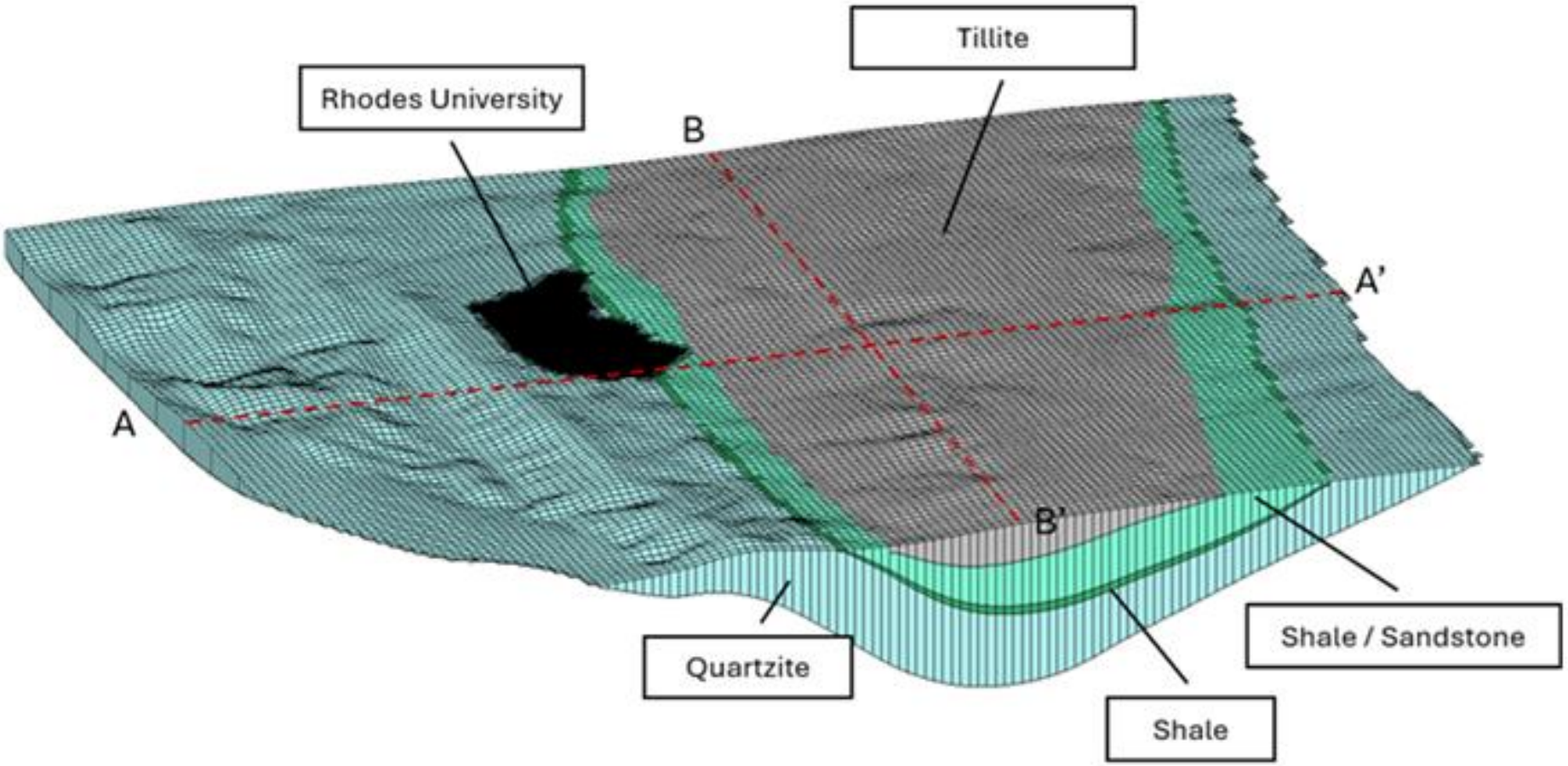


Recharge and Discharge





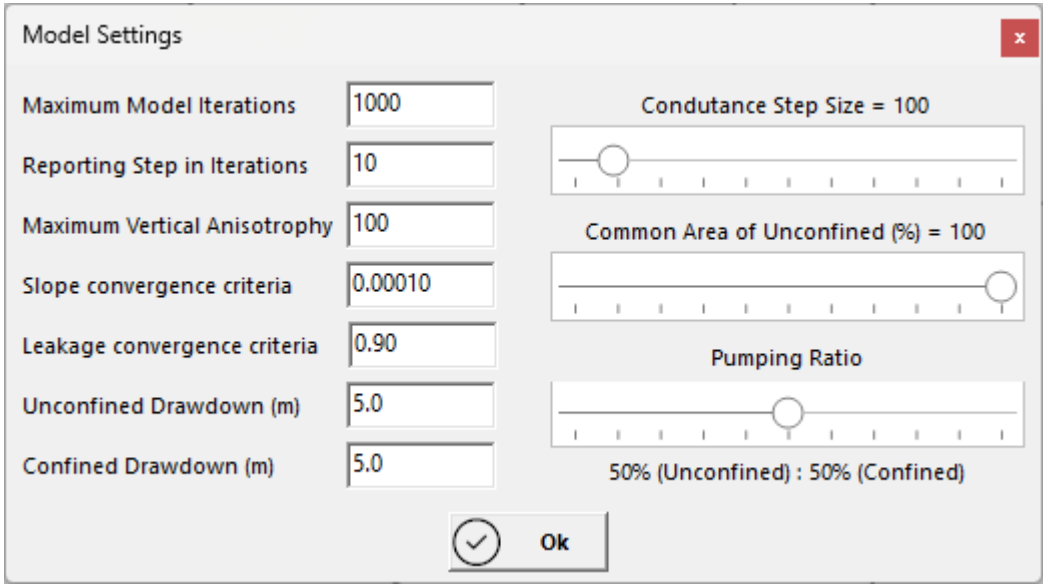
Recharge Zones



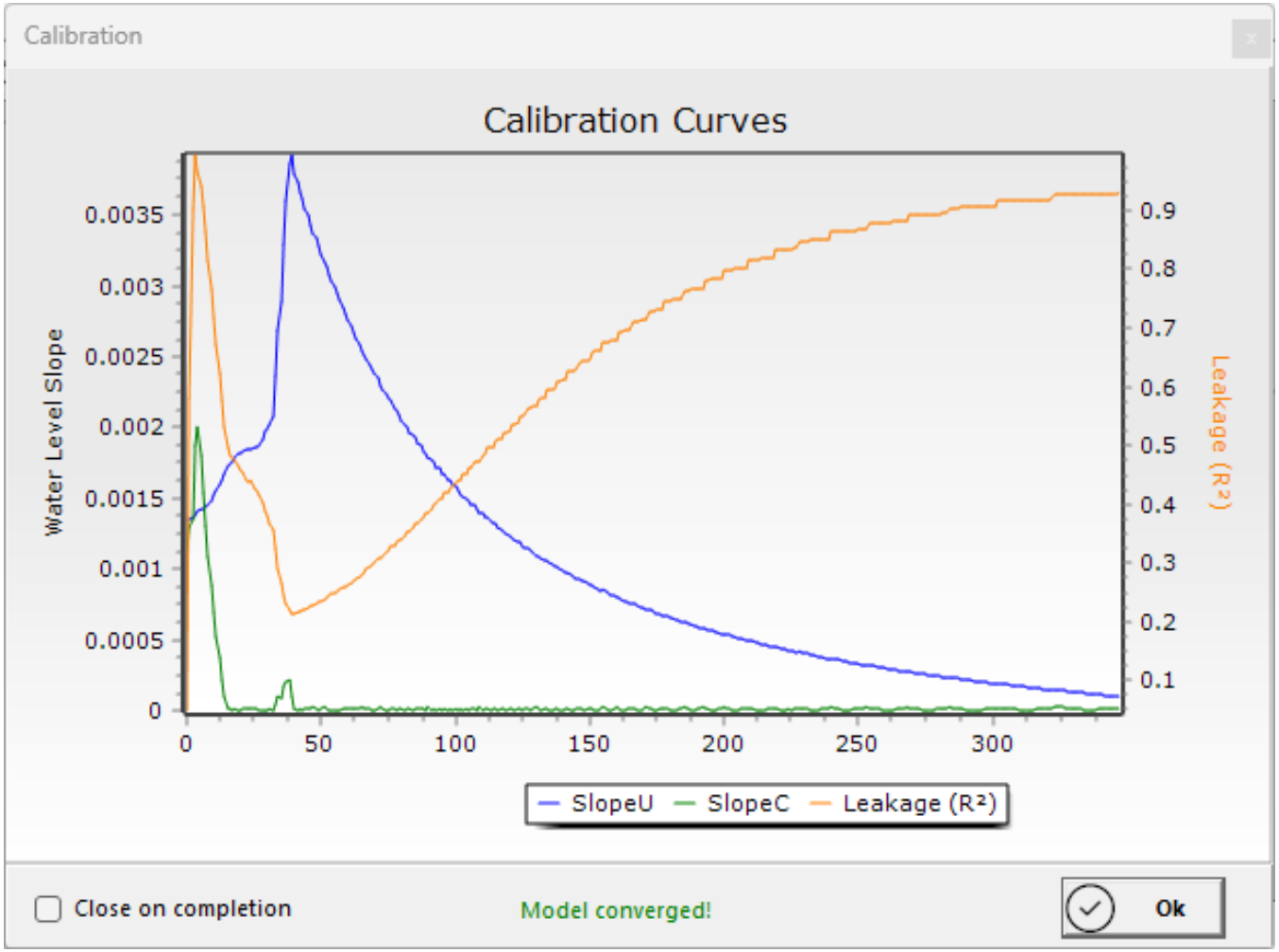


Auto Calibration Steps

1. Verify valid input to the model.
2. Set Q_{leak} to zero (layers are independent of each other).
3. Set Q_{pu} and Q_{pc} to zero (assume a natural state where no abstraction takes place).
4. Calculate Q_{bfu} by setting $D_G = 0.1$ and $P_G = 0.1$ and fitting Q_{GMAX} so that the long-term annual average of Q_{bfu} is equal to the specified annual average baseflow figure.
5. Solve for Q_{lu} and Q_{lc} so that the long-term water level response for each layer exhibits no increasing or decreasing water level trend.
6. Solve for C_u and C_c making use of Q_{lu} and Q_{lc} and assuming the head difference causing Q_{lu} and Q_{lc} is the difference between the long-term average water level in each layer and the bottom of the respective layers.
7. Enable Q_{leak} to connect the layers.

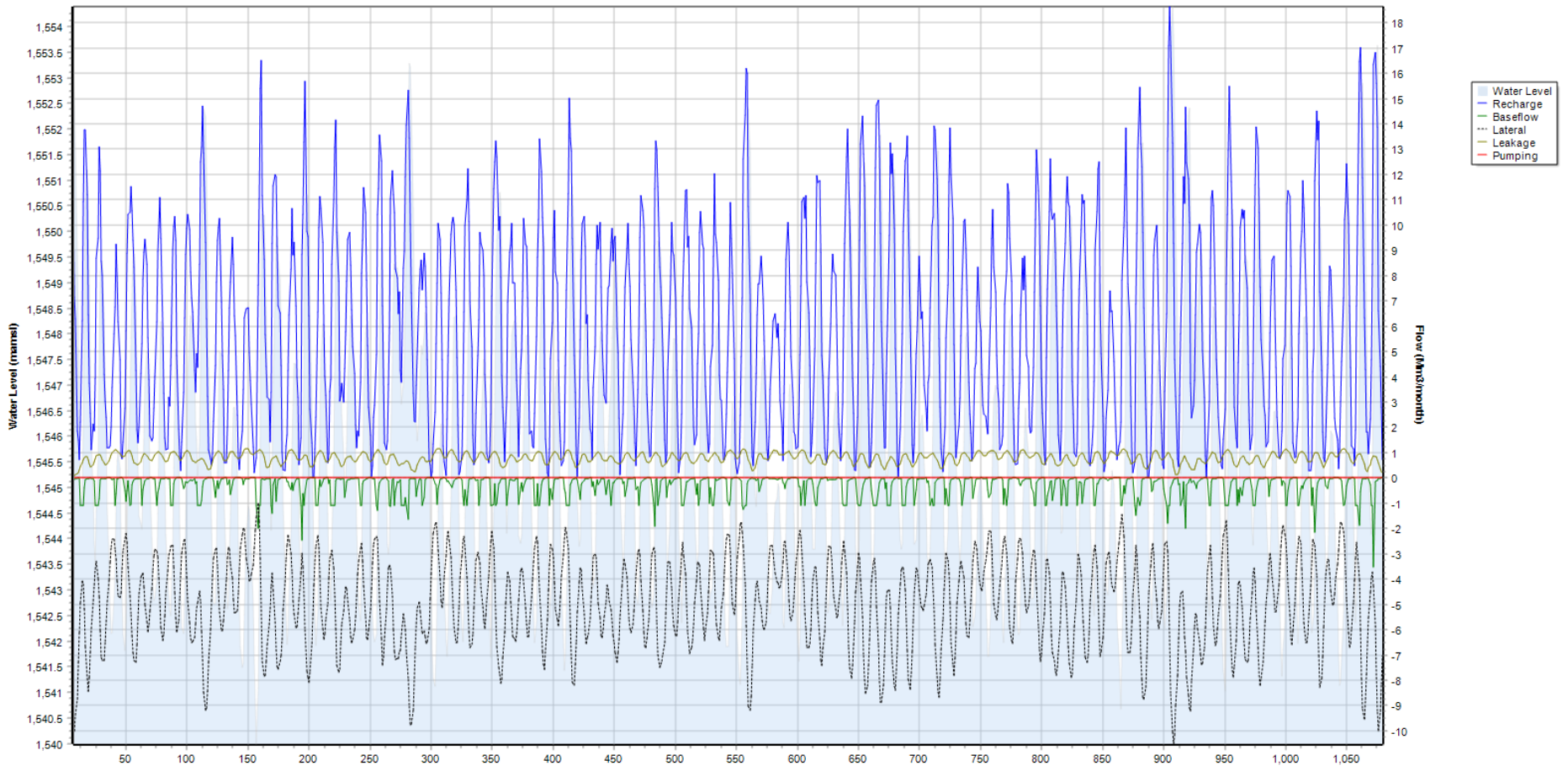


Calibration Result





Leakage Component





Meaning of Leakage R^2