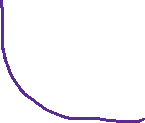
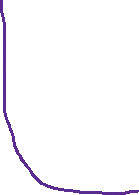
Danielle Rehwoldt

HWRS 482

Figures and Questions

Chart

Description automatically generated



Chart, line chart

Description automatically generated

Table

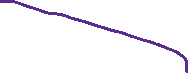
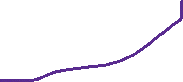
Description automatically generated with medium confidence

Diagram

Description automatically generated

Chart

Description automatically generated



Graphical user interface

Description automatically generated with low confidence

Graphical user interface, chart

Description automatically generated

**a) The gradient is not uniform for the initial steady state conditions - discuss the influences of recharge and the unconfined condition on this nonlinearity.**

*Unconfined systems cause nonlinearity as transmissivity is not seen as constant here. The radial gradient in pressure is a function of the transmissivity of the aquifer. With pumping, we will see this even with a constant recharge rate.*

**b) Determine if the system has reached steady state - consider a point at the well and another at the center of the domain.**

*Yes – through time, after time of about 50 years, the head stayed constant when looking at those panels.*

**c) Find the zone of influence of the well defined in two ways:**

**- Based on the drawdown from the initial steady state to the end of simulation time (end of final no-pumping stress period).**

**- Based on the drawdown from the end of the last pump-on stress period to the end of simulation time.**

*- = w\*L = 380\*500 m = 190,000 m^2*

*- = pi\*r^2 = pi\*(30^2) m^2 = 2827.4 m^2*

**d) How long does it take a point at the center of the domain to reach steady state. At that point, explain how you could divide the domain into a steady and transient part and solve each separately.**

*About 50 years. Divide domain in half and solve. Not sure what you mean by solve. Solving using theis? (will dive into this more once I think about it more).*

**e) Find a constant pumping rate (same throughout the year) that matches the head time series at the middle of the domain.**

500/4 = 125 m/d

**f) Find a constant pumping rate (same throughout the year) that matches the head time series at the well, leaving only a regular, repeating seasonal residual. Are the two pumping rates the same?**

Stumped!

**g) Discuss the sources of water captured by this well. If you're up for a challenge, calculate them for the final pump-on period!**

*Well, we first have recharge (assuming uniform recharge throughout domain), then residual water from water table with flow coming in from the left.*

**h) Discuss how you would define the capture zone of the well. How is it different than our definitions of capture zone so far in the course?**

*The capture zone of the well seems to be wider/spread out. We know that the capture zone defines the set of points in the domain that contribute water to the well. Any particle of water within the capture zone will move throughout the rest of the capture zone until it reaches the stagnation point where water stays still at a 0 gradient. However, it seems that the boundaries here are more “relaxed.” The head values seem to not be following its path as much towards the well.*