

CEE3430 Engineering Hydrology

Homework 3. Groundwater movement

Date: 1/22/14

Due: 1/29/14

Objective. Gain experience applying Darcy's equation quantifying the flow of water in the soil/subsurface.

1. Mays 3.1.1
2. Mays 3.1.2
3. Mays 3.1.4
4. Mays 3.2.2
5. Mays 3.3.4
6. Mays 3.4.2
7. Previous test question

A layered aquifer has the hydraulic conductivity, K , and porosity, α , values and dimensions indicated. Observation wells A, B, C and D penetrate to the top, 2nd, 3rd and bottom layer interfaces as indicated. The head in A is 8 m and the head in D is 6.5 m. Flow is saturated, steady state and vertical.

- a) Indicate the direction of flow (upwards or downwards)
- b) Calculate the equivalent vertical hydraulic conductivity
- c) Calculate the vertical flow rate in each layer
- d) Calculate the heads in observation wells B and C
- e) If a tracer is introduced into well B, calculate the average travel time for it to reach well C

