**Homework 10 Figures**

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**The Challenge**

1. Compare the impact of pumping on the single layer model vs the multilayer model. What physical explanation do you have for the differences?

A picture containing chart

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Figure 1 Head transect of the single layer model, and the top and bottom of 3 layer model

Chart, bar chart, histogram

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Figure 2 Comparing cross-section of two models indicates the physical explanation of the head profiles shown in previous figure

1. Repeat the three layer simulations putting the well in each layer (i.e. once in the bottom once in the middle and once in the top) provide plots and discussions comparing and contrasting your simulations. Provide at least one plot where you have all of your runs in the same figure.

Chart, bar chart, histogram

Description automatically generated

Figure Cross-section of well locations in three layer model. 3A pumping well in bottom layer, 3B pumping well in middle layer inoperable due to low K inclusion, 3C pumping well in top layer

Chart, diagram

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Figure 4 Head contours for well located in bottom layer Figure 5 Head contours for well located in top layer of model

1. Change the properties of your three layer model so that it matches the 1 layer model (but still has 3 layers) put the pump in the bottom layer and compare and contrast with your one layer solution. How does your answer to this challenge compare with your answer to the first?

Chart, bar chart, histogram

Description automatically generated

Figure 4 A three layer model with the same K\_horiz and K\_vert as the single layer still has a unique head distribution due to the well pumping from the bottom of the layered domain.

1. Modify the topography of your domain so that it is no longer sloping left to right (you can make it a valley or have it sloping the other way, whatever you want). Re-run you 1 and 3 layer solutions and explain any differences you do or don't see.

Chart, histogram

Description automatically generated

Figure My experiment drops the top elevation below our constant head boundary. This would imply a confined aquifer and does not make sense for this run.