Due: Feb. 17, 2009

Project 1: Two Dimensional Steady-State Model using MS-Excel

1. Complete part A of the Analysis Section on p. 531-532 in Fetter. Excel spreadsheet should contain graphs as described in Fetter.

2. Use the Excel spreadsheet above (but save as a separate file/sheet) to solve the following:

Consider a ground water system like that shown below (e.g., Toth model).

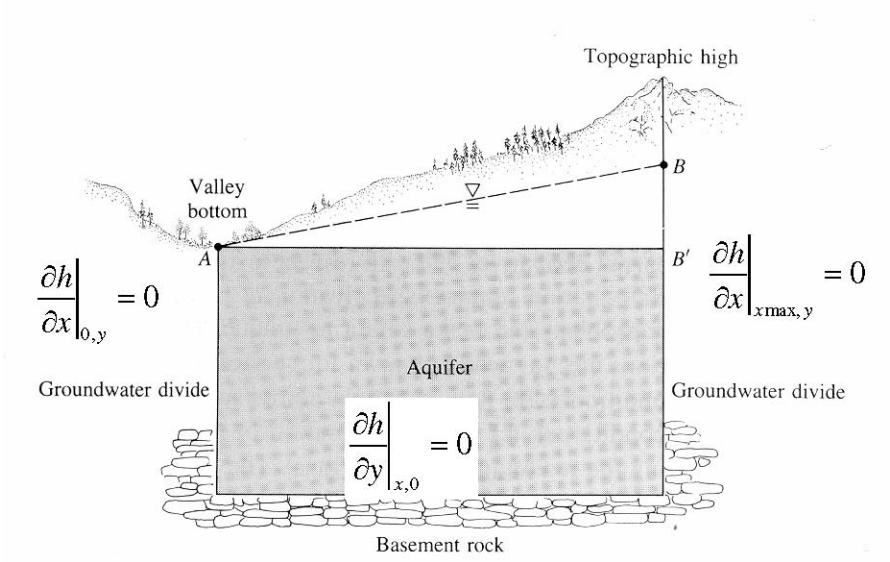

Figure 1. Wang and Anderson, 1982. Introduction to Groundwater Modeling. W. H. Freeman and Co., San Francisco. 237 pp.

The aquifer is 24 m thick and 70 m long. The boundary between the aquifer and the basement rock is a no flow boundary. Groundwater divides also act as no flow boundaries. The upper constant head boundary is given by

Distance	Head 1	Head 2
0	50	50
10	60	79.55
20	70	94.37
30	80	90.82
40	90	79.13
50	100	75.62
60	110	90.48
70	120	120.05

Add a partial penetrating well with a fixed head of 50 somewhere near the center of the domain.

Plot 2D contour of head and streamlines for both constant head boundary conditions with and without the partial penetrating well (a total of 4 separate plots). Briefly discuss your results comparing all four cases.

Be sure that the Excel spreadsheet converges (may take several hundred iterations).