

**Minneapolis-St. Paul International Airport
Modeling Exercise
by Kelton Barr
modified by O. D. L. Strack, 11/17/2017**

Objective: Evaluate the long-term effects of the tunnel 17-35 dewatering wells at the Minneapolis-St. Paul International Airport.

- What are the drawdown effects in the vicinity of the major lakes in the area (e.g. Lake Nokomis, Lake Hiawatha, Mother Lake, Diamond Lake)?
- What effect does a net infiltration rate of 6 inches per year have on the drawdown effects? Or 12 inches per year?

Method: Create a preliminary, single-layer model of the upper aquifer in the vicinity of the Minneapolis-St. Paul International Airport. Use the files included to represent the major sinks (the rivers and the dewatering wells).

Use the following aquifer values:

perm = 152.4 m/day

base = 237 m

thick = 80 m

porosity = .30

To start, use window coordinates of 476,800 4,965,500 for the lower left corner and 487,600 4,976,400 for the upper right corner.

Calibrate the model using the following information: the pre-pumping water table elevation in the vicinity of the 17-35 dewatering wells is approximately 815 feet MSL.

Attached files:

dewatering wells.txt

This file contains dewatering well data: x,y,head,radius. The wells are all head-specified.

airport.pdf and **airport_detail.pdf**

Topo maps of the airport and its environment.

airport_water.pdf

Information on nearby surface water bodies.

streetsall_shp.pdf

A file with local streets.

DRG3633.TIF

A topo map which includes the airport.

MAC dewatering locations-figure1b.pdf

Locations of the dewatering wells.

background_data.pdf A combination of three pages of background maps with coordinates of two points marked on each map.

Contour_shp.dxf

A file with piezometric contours, contour levels not included. This file can be read with Open Office (open software).

Background data.pdf

A file that contains several of the figures listed above with coordinates specified to assist with location.

DELIVERABLE:

You must explain your approach to the modeling exercise, including data used, computer program developed, modeling approach, and results in terms of contour plots of piezometric heads on the day of the final.

Upload the pdf of your presentation onto your dropbox folder.