

Grappling with groundwater

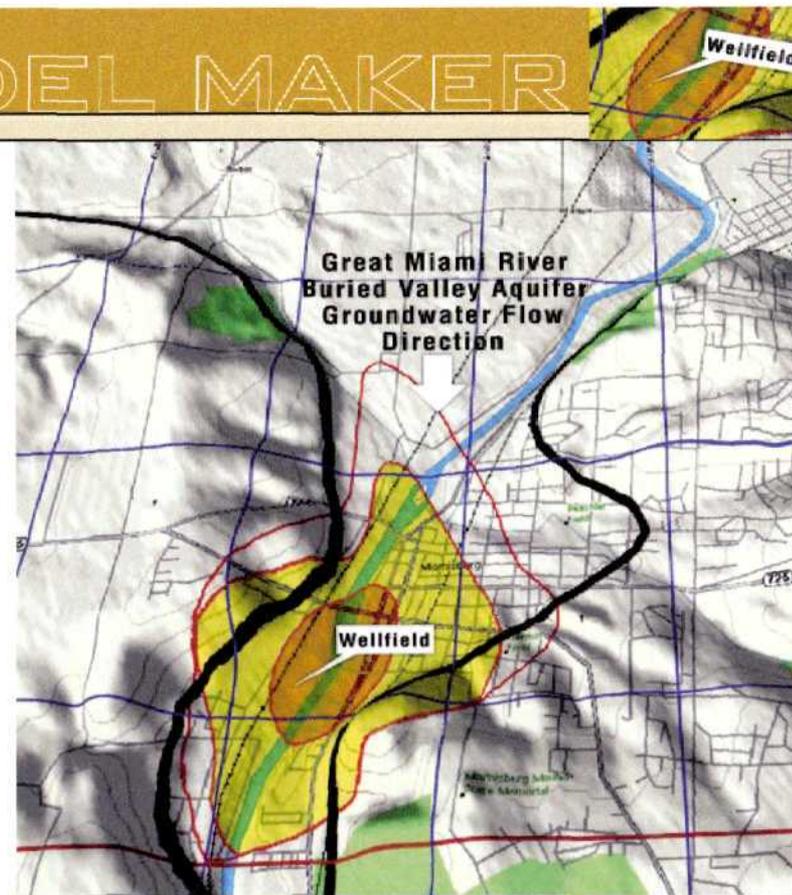
Looking for options to expand their municipal water well field, the City of Miamisburg, Ohio, is determining what effect a new production well would have on an existing tetrachloroethene groundwater plume.

Since the 1990s, a low concentration tetrachloroethene plume has affected the northern portion of the Miamisburg well field, the city's only water source. Tetrachloroethene, a probable carcinogen, is a contaminant from solvents used to clean industrial equipment and is common in the industrial areas of Ohio. While the specific source of contamination is unknown, the city and CH2M HILL, Miamisburg's hydrogeologic consultant for 15 years, have an understanding of the plume's characteristics, including width, depth and downgradient extent. If the contamination levels continue to increase, the city may lose the use of one or more of its production wells,

making the development of additional water sources critical for continued growth.

At the request of the client, CH2M HILL is developing a numerical groundwater flow model (MODFLOW) to evaluate the potential impacts the new production well might have on the groundwater plume movement and contaminant distribution. The model will be developed for use with up to 10 different pumping scenarios, including drought, normal and wet season conditions, and variable locations for the new well placement.

To obtain additional data for use in the model, CH2M HILL advised the city to install staff gauges along the Great Miami River banks adjacent to the well field. The gauges measure daily river water levels, which will be incorporated into the model to verify that it is appropriately simulating actual hydrologic condi-



The orange and yellow shading shows the area required by the Ohio EPA to monitor for early detection and protection against contamination to the buried aquifer, designated by the black line. Protection strategies such as groundwater monitoring, zoning or land restrictions, and public education, have been focused in these areas to help guard against additional contamination from reaching the municipality's water supply.

tions in the river. Once the MODFLOW model is complete, the results will be used with a second analytical chemical model, BIOCHLOR, to evaluate how the tetrachloroethene concentrations may change in the future.

The MODFLOW and BIOCHLOR modeling results will be shared with the Ohio Environmental Protection Agency and, hopefully, will enable the city to obtain approval for a new well site. The project is scheduled for completion at the end of 2003.