

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Pumping unconfined aquifers near shallow streams ANTHONY DAVIS, STEFAN LLEWELLYN SMITH, MAE, UCSD — A well is inserted in a horizontally unbounded water table, with an impenetrable base, at a location removed from a shallow stream. The pressure head is initially zero but changes after constant pumping is begun. It is governed by a diffusion equation and subject to a free surface condition whose formulation invokes Darcy's Law. Fourier and Laplace transforms are used to solve for the pressure gradient, with particular focus on its far field and river surface values which measure from where the well water is drawn. The simpler steady solution gives a misleading guide to the flow development because of the significant asymmetry created by the well location which might be many river widths away from the river.

Anthony Davis
MAE, UCSD

Date submitted: 01 Aug 2007

Electronic form version 1.4