

# Series solutions for steady seepage in three dimensional aquifers

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Steady seepage through a homogeneous aquifer reduces to solving Laplace's equation subject to Dirichlet and Neumann boundary conditions. Typically, the aquifer is modelled using a two dimensional soil profile. Analytic series methods have proved accurate and efficient for these types of problems, compared to numerical schemes such as boundary integral and finite elements. This is especially true for the large aspect ratios encountered in practical applications, where numerical schemes can have significant difficulties in resolving the length and depth scales. However, all of these methods ignore the effects of lateral boundaries, due to the two dimensional nature of the model. In this paper, we present series solutions for steady seepage through a three dimensional aquifer. We model the saturated soil surface as a plane with a horizontal aquiclude as the lower flow boundary. The solutions presented will be compared with two dimensional solutions.