

(i)

THREE DIMENSIONAL MODELLING  
OF  
GROUNDWATER FLOW  
(CONDUIT ANALOGUE)

by

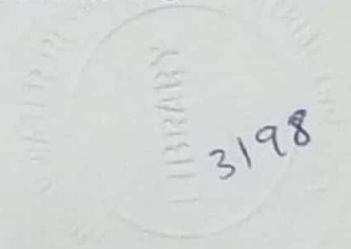
KANWAR MUHAMMAD SHERBAZ KHAN

CENTRE OF EXCELLENCE IN WATER RESOURCES ENGINEERING

UNIVERSITY OF ENGINEERING & TECHNOLOGY

LAHORE \_ PAKISTAN

1987



ABSTRACT

Many different kinds of models are being used for ground water simulation. However, only two models viz, Sand Tank Model and Hele Shaw's Parallel plate Model are such, where fluid movement simulates fluid movement.

The Sand Tank Model suffers from the difficulty of representation of correct permeability and capillary effects in the unsaturated region. Hele Shaw's Parallel plate viscous flow model is suited essentially for two dimensional analysis.

The conduit analogue has been developed to offset the disadvantages suffered by the above two models. The model has been tested for use on confined aquifer as well as unconfined aquifer conditions. The fluid used in the model was water. The results thus obtained have been compared statistically as well as graphically with electric analogue results or field data.

In its present form the apparatus is not capable of simulating the flow within the tube well. However, the modelling of regional phenomenon has been extremely satisfactory.

This study opens the doors to a new era in ground water modelling. Large aquifers may now be modelled on a table 6 ft x 6 ft; with practically any lithologic configuration and a variety of boundary conditions. This model should, however, be used in conjunction with other models.