STATISTICAL CURVE FITTING METHODS APPLIED TO GROUND WATER PUMPING TEST ANALYSIS

by

ARSHAD MAHMOOD

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CENTRE OF EXCELLENCE IN WATER RESOURCES ENGINEERING

UNIVERSITY OF ENGINEERING AND TECHNOLOGY

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ABSTRACT

Matching curve methods to determine aquifer parameters are well known in groundwater hydrology. In these methods the possibility of human error in matching and its consequent effect on the parameters cannot be ruled out. An attempt has therefore been made to determine these parameters statistically using curve fitting methods on a computer. Theis solution, Jacob's modification of Theis solution and Boulton's solution have been transformed into simple statistical equations the coefficients of which are determined numerically using a computer. These coefficients are then used to determine aquifer parameters. Computer programmes have been prepared to carry out this analysis.

Field data of various aquifers have been used to compute aquifer parameters and the results have been compared with those derived manually by the matching curve method and by numerical methods. In all cases there was good agreement between the computed values by all these methods. The statistical methods, however, is much simpler to derive aquifer parameters quickly as compared to the considerable plotting work and judgement involved in the matching curve method.

The computer programme that has been developed can be used by any one interested in computing aquifer parameters.