

Computer - Based Procedure for the treatment of pumping test data in isolated wells

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The gap between the burgeoning developments in water resource systems engineering and their actual application in the diverse aspects and various levels of water resources planning and management appears to be significant. At the field level, for example, many engineers continue to use graphical and subjective methods for dealing with the various curve-fitting and calibration problems they often face. Use of techniques make available to the engineer additional time that can be spent in more important and creative endeavors.

The specific objective here is to present a simple computer algorithm of BIPARTITION for analyzing step-drawdown test data for a well. Some geohydrologists feel that the step-drawdown test is not a useful tool. The intention of this paper is not to become involved in this debate but addressing those geohydrologists who have hesitated using the step-drawdown test because of its involved graphical solution. If the unwieldiness of current curve-fitting procedures has hindered use of this valuable test, it is hoped that this algorithm will encourage its greater application.

In comparing results of the algorithm with published results based on graphical techniques the former were consistently more accurate. In which case primary advantage of the computer method is its speed and convenience, as well as consistency of results.

A computer code is presented for step-drawdown test analysis which is efficient and simple to use: moreover, it is an example of how optimization can be used in a practical way. A listing of the FORTRAN77 code is included along with some example calculations.