



## **An optimization based curve matching approach for identifying the hydrogeological parameters of the confined and leaky-confined aquifers**

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Identification of the hydrogeological parameters of the aquifer systems is an important problem in groundwater engineering. Generally, these parameters are determined by means of the graphical based curve matching approaches. Although these approaches provide effective results in terms of the calculated aquifer parameters, accuracy of them is mostly dependent to the manually conducted curve matching process. In order to overcome this difficulty, an optimization based curve matching approach is proposed to automatically adjust the positions of the superimposed time-drawdown and type curves. In the proposed approach, a nonlinear Generalized Reduced Gradient (GRG) based optimization model is used to determine the best matching point by maximizing the Nash-Sutcliffe (NS) model efficiency which is calculated between the superimposed time-drawdown and type curves. The performance of the proposed approach is evaluated by considering two pumping test data for confined and leaky-confined aquifers. Identified results indicate that the proposed approach can efficiently determine the optimum aquifer parameters without requiring any manual curve matching process.