

Using Two Wells Pumping Test to Estimate the Spatial Distribution of Hydraulic Properties

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Many researches have been proved that tomography can be successfully applied to single well pumping tests at the field site. However, how to apply the technique to large-scale problems would be a challenge. If we could pumping two wells simultaneously, it would make more interference range. For now, two wells pumping test has not been investigated in the field site. Therefore, the two wells pumping test is conducted in this study. The transient observed drawdowns were used to estimate transmissivity (T) and storage coefficient (S). The estimated T and S would be validated, to test whether two wells pumping test makes the better result and decrease cost at times.

Field two wells pumping were conducted in National Yunlin University of science and Technology (NYUST) campus. The analysis method using Hydraulic Tomography (HT) applied to estimate T and S by VSFT2 (Variably saturated flow and transport in 2-dimensions) software.

Results show that pumping tests have more stimuli and more information will be obtained. The advantages of two wells pumping tests can be used to estimate the heterogeneous spatial distribution of hydraulic properties by using fewer pumping tests than single well pumping tests. Therefore, the results of inversion will converge quickly and efficiently.

Keywords: Two Wells Pumping test, Hydraulic Tomography, Heterogeneity