Transmissivity interpolation using Fluid Flow Log data at different depth level in Liwa Aquifer, UAE.

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In groundwater studies, quantification and detection of fluid flows in borehole is an important part of assessment aquifer characteristic at different depths. Monitoring wells disturbs the natural flow field and this disturbance creates different flow paths to an aquifer. Vertical flow fluid analyses are one of the important techniques to deal with the detection and quantification of these vertical flows in borehole/monitoring wells. Liwa region is located about 146 km to the south west of Abu Dhabi city and about 36 km southwest of Madinat Zayed. SWSR (Strategic Water Storage & Recovery Project) comprises three Schemes (A, B and C) and each scheme contains an infiltration basin in the center, 105 recovery wells, 10 clusters and each cluster comprises 3 monitoring wells with different depths; shallow ($\sim$50 m), intermediate ($\sim$75 m) and deep ($\sim$100 m). The scope of this study is to calculate the transmissivity values at different depth and evaluate the Fluid Flow Log (FFL) data for Scheme A (105 recovery wells) in order to understand the aquifer characteristic at different depths. The transmissivity values at different depth levels are calculated using Razack and Huntley (1991) equation for vertical flow rates of 30 m3 /h, 60 m3 /h, 90 m3 /h, 120 m3 /h and then Empirical Bayesian Kriging is used for interpolation in Scheme A using ArcGIS 10.2 software. FFL are drawn by GeODin software. Derivative analysis of fluid flow data are done by Microsoft Office: Excel software. All statistical analyses are calculated by IBMSPSS software. The interpolation results show that the transmissivity values are higher at the top of the aquifer. In other word, the aquifer is found more productive at the upper part of the Liwa aquifer. We are very grateful for financial support and providing us the data to ZETAS Dubai Inc.