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RESOLUTION POWER OF WELL LOG GEOPHYSICS IN KARST AQUIFERS

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ABSTRACT
Empirical relationships are presented between geophysical log parameters and hydraulic parameters in the South Havana Basin karst aquifer. These relationships have not been reported in previous investigations. The most significant results follow. A direct correlation exists in some wells, and inverse correlation exists in other wells, between groundwater flow velocity and natural gamma radioactivity. This shows the presence of two different model collectors. The Dar Zarrouk parameters correlate poorly with aquifer transmissivity. This depends on the relationship that exists between the electrical conductivity and the hydraulic conductivity in the aquifer. If the product of the hydraulic conductivity and electrical conductivity is approximately constant, the relationship between traverse electrical resistivity and transmissivity of the aquifer is more significant. When it is expressed as the quotient between these parameters, and shows little variability, the correlation is more significant between longitudinal electrical conductivity and hydraulic transmissivity. These results contribute to elevating the resolution power of geophysical methods in hydrology investigations in karst aquifers, and they also contribute to the best management of groundwater resources.

Reference: Valcarce, R.M. and W. Rodríguez; Resolution Power of Well Log Geophysics in Karst Aquifers, Journal of Environmental Hydrology, Vol. 12, Paper 2, February 2004.

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