

Permeability of the crystalline basement in Uganda - evidence from 665 pumping tests and implications for solar pumping

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Abstract

Crystalline basement rocks of Precambrian age underlie nearly three quarters of Uganda, providing groundwater supplies to meet ever increasing demand from rural areas and urban growth centres. Development of groundwater sources is commonly based on several factors including physical and socio-economic considerations that have a bearing on their functionality and long term reliability. Here we present new transmissivity data from 665 boreholes across basement aquifers in Uganda calculated from previously unanalyzed pumping test data. Other data are available to help interpret the transmissivity values, including borehole lithological logs, weathering thickness, well design and depth to groundwater. Spatial and depth comparisons are made to relate aquifer permeability to lithology and weathering, and also to relate borehole yields to well design. The data provide an improved understanding of the physical permeability of weathered crystalline basement rock aquifers across Uganda, complimenting earlier studies of vertical permeability profiles in focused areas. The analysis helps inform the physical capacity of the aquifer to supply the borehole yields to meet increasing demands, and application the potential for higher abstraction technologies, such as solar pumps.