Temporal Geoelectric Behavior of Dyke Aquifers in Northern Deccan Volcanic Province, India

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Despite large, linear dyke swarms exposed in many parts of the world, the groundwater the significance of dyke features in hydrogeological set up of the hard rock terrain like DVP is not clearly known. Using two season vertical electrical sounding (VES) data, an attempt has been made to assess the groundwater potential of the regional dyke aquifer setup from hard rock (basaltic) terrain in Nandurbar district of Maharashtra state, India forming a part of the Narmada-Tapi tectonic feature, running across central India. Resistivity modeling revealed heterogeneity in subsurface dyke litho-environment with intermittent carrier and barrier stretches. The 2- and 3-D iso-apparent resistivity profiles exhibited enhanced infiltration during post-monsoon and favorable conditions for development of shallow aquifers. Temporal variability in geoelectrical parameters implied towards selective lateral and/or vertical recharge for the site-specific development and augmentation of saturated zones. With proper groundwater management, these elongated geofeatures with enormous lengths, widths and multiple occurrences can be employed as proficient water reservoirs. The study, for the first time, focuses on seasonal geoelectrical behavior of the subsurface and implies that the information is imperative in devising appropriate groundwater management policies.