RELATIONSHIP BETWEEN GEOLOGICAL STRUCTURE AND GEOPHYSICAL CHARACTERISTICS OF HARD ROCKS WITH GROUND WATER POTENTIAL: A CASE STUDY FROM NOCHCHIYAGAMA, ANURADHAPURA DISTRICT

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Deep water supply bore holes are commonly used in small scale rural and small town pipe water supply schemes in Sri Lanka. Geoelectrical resistivity investigation method is used to locate sites for these deep boreholes and to understand aquifer properties of the geological formations. However, the properly documented scientific data on these investigations are not available with many organizations who are dealing with groundwater explorations.

Present study focuses on the validity and accuracy of the resistivity method in identifying hydrogeologicaly important zones in the hard rock.

Under the present study geoelectrical resistivity sounding and profiling were carried out in a hard rock area covering 16 Grama Niladari divisions in the Nochiyagama Pradesiysaba area, in the Anuradhapura district. Borehole log data from 25 boreholes were used in this study for comparison with geophysical investigation results.

The geoelectrical profiling was carried out to understand the lateral variations of the geological properties at selected sites. The results of the resistivity sounding were correlated with actual borehole data and it is observed in majority of boreholes that these two types of information have a good correlation. The flushing yield of the bore holes was used to evaluate the validity of the assessment of hydrogeological conditions of well sites (good, fair or unfavorable) by resistivity investigation method and found that the results are in good agreement.