

GROUND MAGNETIC SURVEY IN WAHAWA GEOTHERMAL SYSTEM

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The scattered thermal spring belt in the Vijayan Complex of Sri Lanka provides inconclusive evidence about a heat source beneath its crust. Among the thermal systems, Wahawa stands out to be diversely important as it consists of more than 23 scattered hot springs and one artesian well within an aerial extent of 200 m × 500 m (check). These springs, presumably controlled by a fracture pattern aligned to the northeast direction that crosscuts a dolerite dyke close to the hot spring field. As lack of details on hot spring sites, particularly near-surface characters, is one of the main drawbacks to identify the system itself, this study is focused on identifying the geological structures in this area using a ground magnetic survey. A detailed ground magnetic survey was conducted in 10 km × 10 km area covering Wahawa geothermal system and the adjacent area. Data were collected at a 500 m interval at a rate of 0.2s., avoiding densely populated areas and power lines to maintain a better data quality. The raw data were synthesized into a total magnetic intensity map that clearly outline two highly anomalous magnetic structures. Susceptibility of these two structures is more or less in the same dynamic range and geochemical analyses of the rock samples confirm a similar chemical composition. The magnetic results overlain with the existing geological data confirm that one of the anomalies corresponding to already identified dolerite dyke extends towards the northwest direction. The other structure with magnetic signatures similar to that of the known dolerite dyke and perpendicular to the main dyke is turned out to be another dyke cross cutting the former. Detailed field mapping along the magnetic anomaly confirms the existence of this new dyke that is not discovered previously.

These results opened up a new avenue for future directions of the geothermal research as they provide the basic idea about the structural control of the geothermal system in Wahawa area. This study strongly suggests that there is a direct link between dolerite dykes and hot springs and possibly the fracture pattern of the area also influences the heat source for hot springs.
