



**Delineate Vein Quartz and Bedrock  
with the aid of 2D Resistivity Technique  
Compared with Ground Truths**

**M.H. Zufra**

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## **Abstract**

Sri Lanka consists of four major lithotectonic divisions. And nine-tenths of the island is underlain by Precambrian crystalline rocks, the rest being made up mainly of Miocene Limestone and Quaternary deposits along the north-western and northern regions. Principally, mineral resources are highly confined to the Highland/Vijayan boundary zone. One of the main mineral resources along this zone is vein quartz, predominantly south and southeastern part of the island. Mahagama and Randeniya are two major occurrences which were investigated in detail including 1D resistivity survey and 2D resistivity profiling by the Geological Survey and Mines Bureau (GSMB). Generally vein quartz boulders are confined to elongated ridges along strike direction displaying a weather resist nature. Both the vein quartz and bedrock resistivity values are in the same dynamic range and advanced processing techniques have to be identified to screen out vein quartz from the bedrock. The field survey was performed using ABEM Terameter (300-c SAS) and AGI (Advanced Geosciences, Inc.) Mini-sting system. The terrain condition only permits to perform resistivity soundings and profiles parallel to the ridges. 1D data was processed using Resist freeware package while maintaining RMS (Root Mean Square) error below 5%. 2D data was processed via EarthImager licensed software by introducing terrain files to compensate terrain undulations and applying resistivity ranges  $10\Omega\text{m}$ - $3000\Omega\text{m}$  and  $25\Omega\text{m}$ - $3000\Omega\text{m}$  for Mahagama and Randeniya respectively. 2D resistivity sections obtained from various profiles in the area reveal that quartz has high resistivity range with differential weathering and bedrock corresponds for the similar resistivity range with concentric weathering. Therefore, it clearly defines the sharp contact between the vein quartz and the bedrock with different weathering patterns as the key to delineate the two entities.

**Key words:** 2D Resistivity, Vein quartz, Vertical Electrical Sounding (VES), Mahagama, Randeniya