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VERY LOW FREQUENCY ELECTROMAGNETIC (VLF EM) METHOD FOR VEIN GRAPHITE INVESTIGATION IN CRYSTALINE ROCK TERRAIN: A CASE STUDY IN RANGALA, SRI LANKA

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Vein graphite formations in Sri Lanka show systematic orientation rather than random. They follow define brittle structures alone in mineralized regions, but pinching out behaviour of veins make them difficult to be detected by traditional drilling methods. At present, exploration for new graphite veins is important factor for continuation of graphite industry.

Electromagnetic Surveys are some of the most common survey methods in globe for the conductive mineral exploration. A Very Low Frequency (VLF) electromagnetic survey was carried out using EM 16 handheld instrument for the field data collection. Rangala graphite mine area is situated in the Kegalle district within the crystalline terrain of Sri Lanka. Survey grid was designed perpendicular to the primary signal transmitting direction.

Positive to negative inphase reading variation along survey lines was used as primary indication of subsurface conductor. Simple numerical filtering method was used to reduce random fluctuation of the anomalies. Interpretation of individual anomalies indicated that the conductive zones present at an average depth of 10m-15m.

These anomalies have followed vein orientation of NW-SE as shown by previous investigators. Overlapping of anomalies with already identified veins and drill hole data verified relationship between anomalies and graphite veins. At least fourteen conductive bodies were identified during the study, indicative of graphite veins. According to the anomalies, lengths of the veins vary between 20m-150m with steep dipping.

VLF anomalies indicated a very significant correlation with the already located graphite veins, thus conforming the other anomalies represent yet undiscovered graphite veins. The study further revealed that VLF method can be effectively and economically used in graphite exploration in Sri Lanka, instead of costly drilling based investigations.