

Newly recognized IOCG-like mineralization at Gadarwara, M.P, India

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Airborne geophysical surveys by NGRI identified a huge magnetic anomaly over 50 km² at Gadarwara, India in a region covered by ~300 metres of cover. Drilling indicates that the oval-shaped magnetic anomaly is caused by underlying magnetite-bearing rocks belonging to Mahakoshal Formation of Archean to early Proterozoic age. The recent geophysical ground magnetic traverse on the anomaly suggests a basement source upto 1.8 km in width in an east-west trending continental-scale tectonic rift zone (Narmada-Son Lineament) which separates the Dharwar Craton to the south from the Bundelkhand Craton to the north. The rocks are characterized by interbedded banded hematite jaspelite and banded magnetite iron formations with pervasive carbonate alterations. The core samples were studied for carbon and oxygen isotope ratios, alteration assemblages by SWIR, SEM, EPMA, Laser Ablation ICP-MS U-Pb monozite and zircon geochronology. The following data and conclusions are presented. 1. The $\delta^{13}\text{C}_{\text{carbonate}}$ ranges from -0.4 to -11.22 ‰ and $\delta^{16}\text{O}_{\text{carbonate}}$ from +15.2 to 21.8 ‰ respectively 2. Magnetite typically contains low Ti (<0.03 wt%) 3. short-wave infrared spectroscopic analyses have identified siderite, ankerite, Fe chlorite, illite, kaolinite, montmorillonite and actinolite 4. Copper and gold are hosted in chalcopyrite and pyrite 5. REE are hosted in magnetite-bearing apatites, zircon, monazite and xenotime grains up to >200µm.

Based on the above observations the Gadarwara area is highly prospective for IOCG-mineralization and further work underway will improve our understanding of this system.