MULTI-DISCIPLINARY CONTRIBUTION TO METAL EXPLORATION IN THE JAURU TERRANE, SOUTHWEST AMAZON CRATON

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ABSTRACT

The Jauru terrane, southwest Amazon Craton, is a Paleoproterozoic accretionary terrane divided into three belts: Jauru, Araputanga and Cabaçal. The compressive setting that united these belts resulted non-sequential subduction events observed by the presence the Cachoeirinha and the Santa Helena orogenesis. This compressive subduction-related setting created adequate environments for metal mineralization as Au, Cu, Ni and Zn. Geophysical, geochemical and isotope data were used to evaluate the region tectonically, locating known and potential exploration zones, the type of mineralization, and geophysical modelling the target zones using all data available as constraints. Magnetic and gravity fields were mainly used for modelling and tectonic assessment, showing 5 to 10 km wide outcropping and non-outcropping mafic intrusions intercalated with major felsic to intermediate granitic suites. These models corroborated with the main northwest-southwest trends and tectonic lineaments that characterize the terrane. Gamma-ray spectrometry was used to evaluate outcrops and hydrothermally altered zones, evidencing known and possible sources for Au, Cu, Ni and Zn exploration. Major and trace elements geochemistry, along with minor Nd-Sr analyses, showed magma patterns and tectonic environments related to the evolution of a terrane in a compressive setting. The chemical data indicated trends of large batholiths of juvenile magma interspersed with lightly enriched MORB-like mafic intrusions. A model for the evolution of the Jauru terrane, based on the described data, links the characteristics and tectonic environment of the located intrusions with targets for brownfield and greenfield exploration.

Key Words: Amazon Craton, Potential Field Methods, Gamma-ray Spectrometry, Geochemistry, Mineral Exploration.