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Geology of the Lac de Rotis (33C10), Lac Bernou (33C11) and Lac Boyd (33C15) Areas

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Abstract

A geological survey at 1/50,000 scale was conducted in 2007 to the west of Opinaca Reservoir. This area is underlain by Archean rocks of the Opinaca Subprovince to the north and of the La Grande Subprovince to the south. The objectives of this work are: 1) to update the geological coverage of this area, 2) to document the boundary between the two subprovinces, and 3) to assess the mineral potential of the area.

The La Grande Subprovince is represented by the Eastmain Group, which in the study area comprises the volcanic Bernou and Kasak formations and the sedimentary Pilipas and Low formations. These supracrustal sequences are affected by three episodes of deformation. Many multiphase intrusions with dioritic, tonalitic, granodioritic, and granitic compositions crosscut these units. Rocks in the La Grande Subprovince are metamorphosed to the middle amphibolite facies.

The Opinaca Subprovince is composed of migmatized paragneisses and diatexites of the Laguiche Complex, with younger intrusions assigned to the Jamin and Boyd suites. These units exhibit a dome-and-basin structural style. In the Opinaca, the metamorphic grade reaches the upper amphibolite and granulite facies.

The youngest rocks in the area are Proterozoic in age. They consist of diabase dykes crosscutting all Archean units. These dykes are assigned to the Matachewan, Senneterre, and Mistassini swarms.

Based on our observations, six regional metallogenic settings are defined: 1) porphyry-type Au-Cu-Ag occurrences; 2) gold associated with volcanogenic massive sulphides; 3) gold associated with deformation zones or with contact zones between sedimentary and volcanic sequences; 4) epigenetic gold occurrences associated with metamorphic veining; 5) gold occurrences associated with iron formations; and 6) rare element occurrences associated with tourmaline-bearing pegmatites. Epigenetic gold occurrences are similar to those observed on the Éléonore property, particularly the Roberto gold deposit.