

# Geology of the Lac Simon region (32G15-200-0102)

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## Abstract

A geological survey at 1:20,000 scale was carried out in 2010 in the Lac Simon region (32G15-200-0102) as part of the knowledge acquisition plan of the mining heritage fund (Fonds du patrimoine minier). The objectives of the mapping project were to: a) improve the understanding of the stratigraphy of the Waconichi Formation volcanic units, which host the Selco-Scott volcanogenic massive sulphide deposit; and b) assess the potential for orogenic lode gold mineralization in rocks belonging to the Lac Doré Complex and the Chibougamau Pluton.

North and west of the Chibougamau Pluton, the Waconichi Formation (2730 to 2726.5 Ma) comprises the Andy, Scott and Allard members. Age dating of a tuff containing lapilli and medium-sized blocks ( $2729.0 \pm 1.1$  Ma) to the west of the Chibougamau Pluton established the Andy Member as the base of the Waconichi Formation. The Scott member hosts the main volcanogenic massive sulphide showings, which are positioned at the base or summit of several volcanic centres (andesite to rhyolite) of limited extent (<4 km) and cut by quartz- and plagioclase-phyric felsic intrusions of tholeiitic to transitional affinity. The summit of the Waconichi Formation is marked by basalts and volcanoclastic rocks of transitional to calcalkaline affinity belonging to the Allard Member; these units are of regional extent (>30 km).

The Chibougamau Pluton consists primarily of two phases in the core of the NW-SE Chibougamau Anticline: early diorite injected by younger tonalite. The mafic dykes (porphyritic diorite) and felsic dykes (aplite) constitute later minor phases. Between Lac David and Lac Simon, a breccia zone approximately 4 km thick has been observed at the contact between the Chibougamau Pluton and the Lac Doré Complex (pyroxenite, gabbro, anorthosite, granophyre).

In the western parts of the Chibougamau Pluton and the Lac Doré Complex, polymetallic veins (Au-Ag  $\pm$  Cu  $\pm$  Zn) are transposed in shear zones oriented E-W to ENE-WSW. Veins carrying gold and copper-gold mineralization are observed in E-W and NW-SE shear zones, which are cut by NNE-SSW shear zones.

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