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Petrology and geochemistry of Ni-Cu-PGE showings in the Portneuf-Mauricie Domain

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Abstract

The Portneuf-Mauricie Domain is located mainly in NTS sheets 311 and 31P. It consists of metasediments and metatuffs of the Montauban Group, which are cut by plutons of the La Bostonnais Complex. This sequence was injected by differentiated, mafic-ultramafic intrusions hosting several Ni-Cu±PGE showings.

The Ni-Cu±PGE showings that are subject of this study share numerous similarities. The intrusive bodies hosting the showings consist of gabbroic rocks, pyroxenites, and peridotites. The showings are composed of mostly disseminated sulfides with a strong Cu-Ni enrichment. The Lac Nadeau and Rousseau showings are the only ones to exhibit precious metals enrichment in sulfides. The gabbroic rocks, whether mineralized or not, have geochemical signatures typical of magmatic arc environments. However, the Rousseau showing is distinct in that its composition is similar to that of E-MORB type magmas. For all showings, sulfide-forming sulfur was derived, at least in part, from a crustal source.

This project will contribute to our understanding of the development and significance of the intrusions and Ni-Cu-PGE deposits in the evolution of the Portneuf-Mauricie Domain and the Grenville Province as a whole. It will also allow a better assessment of the mining potential of the Grenville geological province.

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