

A Comparison between the McLeod Road Sequence and the Chisel Sequence, Snow Lake, Manitoba

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Abstract

The McLeod Road sequence is a fault bounded thrust panel located within the Flin Flon – Snow Lake greenstone belt, in the internides of the Trans-Hudson Orogen. The McLeod Road sequence which comprises a series of mafic and felsic volcanic and volcanoclastic rocks is host to the structurally controlled New Britannia gold mine and a series of other deposits. Mineralisation is located at stratigraphic contacts between units of contrasting competency at the intersection of a fault and a secondary structure, typically a fold hinge however the geological controls on mineralisation are poorly understood. Refinement of the volcanic stratigraphy of the McLeod Road sequence through detailed lithostratigraphic mapping, lithochemistry and structural analysis has identified five distinct lithostratigraphic units which are repeated within the sequence along a contact parallel fault. Unit three a felsic plagioclase phyric volcanoclastic unit is identified as a thick distinct marker horizon identified based on several physical parameters, such as dark wispy clasts, interpreted as flattened fiammé and fine ash beds, which suggest that it is a sub aqueous syn eruptive pyroclastic flow. Improved understanding of the MB sequence suggests that all features are indicative of a deep marine below wave base setting, and this has implications for the evolution of the basin setting. Comparison with the Chisel sequence of the Snow Lake Assemblage shows that it is geochemically of a similar setting however two lithostratigraphic units have both distinct physical and geochemical characteristics to those of the MB sequence which together indicate a time stratigraphic setting for the deposition of the units. Changes in the basin development and internal geometry within the panel have implications on the understanding of structures controlling mineralisation.