

Preliminary interpretation of the geological history and characterization of a Paleoproterozoic metasedimentary cover sequence near Daly Bay Complex, Nunavut, Canada

BILLY GARRISON AND MIKE YOUNG

Department of Earth Sciences, Dalhousie University, Halifax, Nova Scotia, B3H 4R2

The nature and timing of collision between the Archean Rae and Hearne cratons of the Western Churchill Province remain uncertain. The Snowbird Tectonic Zone (STZ) is a 2800 km-long belt separating units with highly contrasting geological and geophysical properties and is thought to represent the suture between these two cratons. Paleoproterozoic (2.2–2.0 Ga) sedimentary cover sequences on the Rae and Hearne cratons are generally distinct from each other and thought to have formed independently prior to collision. More recent studies on the tectonometamorphic history of the STZ dispute the assertion of a 1.9 Ga STZ suturing event and instead suggest a much earlier (ca. 2.5–2.3 Ga) collision. The study area is in eastern mainland Nunavut near the northern boundary of the Daly Bay Complex and may contain the closest known cover sequence relative to the STZ. As part of the Geological Survey of Canada's Geo-mapping for Energy and Minerals program, a suite of samples was collected along with field observations and structural data. The main purpose of the study will be to characterize the different units within the cover sequence and to define a relative geological history. This will be done using field observations as well as microscopic analysis and subsequent comparison of the units to other cover sequences overlying the Rae, Hearne, and Daly Bay Complex. In addition to the characterization and comparison of the cover sequence, five samples were collected within a gossanous zone for geochemistry/assay to assess any economic potential. The Western Churchill Province is one of the largest fragments of Archean crust, although it is still poorly known overall. The characterization of the stratigraphic units and detrital zircon geochronology will help us discern the provenance of the cover sequence, and in doing so will help us to better understand the timing of the collision of the Rae and Hearne cratons.