Geochronological study of a previously defined geochemical stratigraphy for the Buchans Group, Buchans area, Newfoundland, using LAM-ICP-MS

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The Buchans mine, to date, is the largest producer of VMS-style ore mineralization discovered on the island of Newfoundland. The site has been characterized as a classic Kuroko type deposit exhibiting a well-preserved alteration halo, and mechanically transported ore. *In situ* and transported ores were mined at the site beginning in 1927 until its closure in 1984. Since the closure of the Buchans

mine, exploration has been hindered by the stratigraphical and structural enigmas of the surrounding area. With the understanding of the hanging wall and footwall chemostratigraphy of the ores, the study of the stratigraphy is a key exploration tool.

Geochronological data obtained using zircon grains are presented for the Buchans Group to support recent geochemical advances made in the region. Zircon is a mineral that is commonly used in geochronology due to its robust nature. It contains little common lead (providing more precise ages) and is very resistant to weathering or alteration processes that may affect the system.

Samples were obtained from (1) the Sandy Lake Formation, (2) the Lucky Strike footwall, and (3) the Prominent Quartz Rhyolite. Sample preparation and analytical procedures were carried out at the Department of Earth Sciences, Memorial University of Newfoundland laboratories using LAM-ICP-MS (Laser Ablation Microprobe-Inductively Coupled Plasma-Mass Spectrometer) as a geochronometer and a SEM (Scanning Electron Microprobe) to determine the extent of zonation or inclusions. U-Pb dating of zircons using this technique provides efficient and rapid age analysis of in situ and detrital zircons in rocks. These data help pinpoint likely sources for detrital zircons in the Sandy Lake conglomerate and provide ages for the in situ volcanic rocks.