Future directions: overview of mineral resource research planned for the Inco Innovation Centre at Memorial University

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An Inco Innovation Centre is in development on Memorial University's campus in the (former) Thompson Student Centre. The Centre is funded by contributions from Inco, Ltd., and grants from the Atlantic Innovation Fund and other programs. Research to be undertaken in the Centre will focus both on mineral resource development, particularly at Voisey's Bay, as well as on a host of other more general innovative activities. For mineral science research, there will be geophysics and geochemical components that will aid in advanced exploration, sulphide ore delineation and mine planning; and process engineering components that will support development of hydrometallurgical technologies. More than sixteen Memorial faculty members from Earth Sciences and Engineering will be involved, as well as several researchers from Voisey's Bay Nickel Company and Inco Ltd.

As an example of the planned mineral resource research, state-of-the-art analytical instrumentation will be developed for geochemistry and mineralogy. The equipment will include a multicollector magnetic sector ICPMS coupled to a deep-UV excimer laser, and a scanning electron microscope (SEM) equipped with an electron backscattered diffraction (EBSD) system for mineral identification. Isotopic work on a variety of metals that are relevant to ore systems – iron, copper, osmium, lead – will be possible with the multicollector ICPMS. Using the laser, spatial variations in isotopic compositions within minerals will be documented with the expectation of resolving temporal changes in the physical and chemical environment of sulphide ore genesis. The SEM-EBSD system will provide a platform by which to quantify mineralogical variations within the deposit, which will be critical to understanding the metallurgical response of ores to processing. Results from both instruments will be integrated with three dimensional models of the orebodies to facilitate better understanding of their spatial distribution.

Although the immediate applications for geochemical research will be focussed on ore systems, the vision of the Centre as a facility for general innovative research will lead to new applications in related fields such as crustal evolution, global change, groundwater quality and geoarchaeology.

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