

Overview of Targeted Geoscience Initiative 4 (TGI-4) Ore System Projects: a National, Thematic Program to Enhance Effectiveness of Deep Exploration

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Between 1980 to 2008, Canada's reserves of metals experienced a continuous decline, resulting in levels today that are less than half of those reported at the end of 1980. A key aspect contributing to this decline is the increasing rarity of surface discoveries in Canada forcing the exploration industry to explore even deeper for new resources. Even in established mining districts, there has not been substantive exploration below 300 m from surface due to limitations in geoscience knowledge of ore deposit and geochemical and geophysical methods. In light of this, NRCan renewed the Targeted Geoscience Initiative (TGI4) in 2010 for 5 years with a budget of \$25M. The program focuses on providing industry with the next generation of innovative geoscience knowledge and analytical techniques that will result in more effective targeting of buried mineral deposits, thereby increasing discovery rates.

The first steps of TGI4 developed underpinning scientific hypotheses that define the critical knowledge gaps within ore systems of interest. These hypotheses, in turn, focus the collaborative efforts of geoscientists from the Geological Survey of Canada, provincial and territorial government surveys, industry and academia. In the summer of 2011, TGI4 launched its thematic, knowledge-driven projects that are based around the following ore systems: 1) Lode Gold, 2) Nickel-Copper-PGE-Chrome, 3) Intrusion Related systems (e.g. porphyry), 4) SEDEX, 5) Volcanogenic Massive Sulphide systems, 6) Uranium and 7) Specialty Metals (e.g. Nb, REE). In addition, scientific studies within the fields of geophysics, geochronology and analytical geochemistry are being used to advance methodological development.

Unlike previous incarnations of TGI, the thematic nature of TGI4 means that individual projects are not centred on a geographic region, but instead integrate data and knowledge from multiple mining camps across Canada. In this way, the optimum deposits are used to support studies within a single ore system, in order to best achieve the program objectives.

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