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EARTH SCIENCE SECTOR
GENERAL INFORMATION PRODUCT 96e

**Targeted Geoscience Initiative 4
Gold Ore Systems**

Geological Survey of Canada

2012

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Canada



Targeted Geoscience Initiative 4 Gold Ore Systems

Gold is recognized globally as a symbol of wealth, success and fortune. It plays an important role in Canada's economy. In 2011, gold production ranked fourth for the total value of mined metals in Canada and first in the number of operating mines in the country.¹ Despite recent increases in exploration, Canadian gold reserves have significantly declined in the last two decades. In 1990, Canadian gold reserves were 1542 tonnes (t), but by 2008, these reserves decreased to 947 t and in 2010 rose back to 1470 t.²

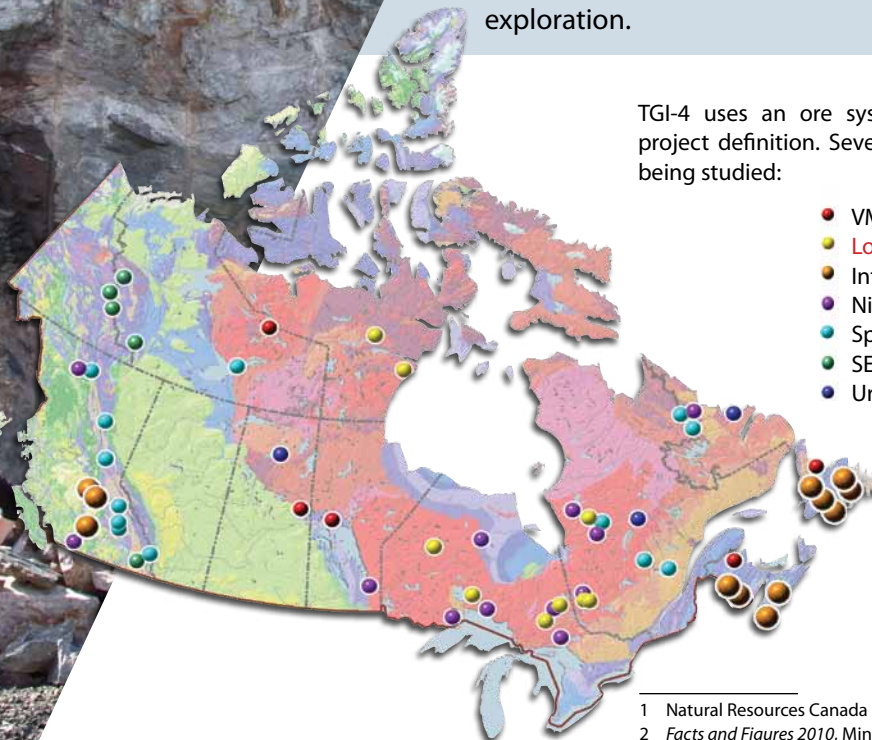
New gold deposits will be found buried far beneath the surface and to find them, it is important to understand why some areas of Canada are endowed with gold and others are not. Knowing what controls the location of these gold districts (lode gold deposits, many of which are found in the Canadian Shield, have supplied more than 80 percent of Canada's historic gold production)³ is critical to lowering the exploration risk inherent in searching for new deposits. For example, why do many deposits occur along major crustal structures or faults?



The Targeted Geoscience Initiative 4 (TGI-4) is a collaborative federal geoscience program that provides industry with the next generation of geoscience knowledge and innovative techniques to better understand, model and detect buried mineral deposits, reducing some of the risks of exploration.

TGI-4 uses an ore system approach to project definition. Seven ore systems are being studied:

- VMS
- Lode gold
- Intrusion related
- Ni-Cu-PGE-Cr
- Specialty metals
- SEDEX
- Uranium



1 Natural Resources Canada
 2 Facts and Figures 2010, Mining Association of Canada
 3 J.W. Lydon (NRCan), 2007



The Gold Ore Systems Project will collect data about the nature, location and depth of gold deposits. Scientists will then translate the data into information and knowledge for finding deeply buried deposits. Recent major gold discoveries in Ontario and Quebec highlight the lack of knowledge about the processes that result in a deposit and the processes that leave markers in the surrounding geological environment.

Some gold deposit types are underexplored and relatively poorly understood, which creates scientific and exploration challenges as well as new opportunities.

The project will study three main gold deposit types:

- banded-iron formation-hosted deposits
- intrusion-related deposits
- large, fault-related Archean gold districts

Being largely field-oriented, the project will bring together geochemistry, three-dimensional reconstruction and geology to improve gold exploration models. Research field activities will take place in Canada's mining districts and emerging camps, most of which are in the Canadian Shield.



**Targeted
Geoscience
Initiative 4:
Increasing Deep
Mineral Exploration
Effectiveness**

For more information about the Gold Ore Systems Project, contact

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