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**Cumulative effects in the Cobalt
Watersheds projet**

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CUMULATIVE EFFECTS IN THE COBALT WATERSHEDS PROJECT



Renewed exploration or development in historical mining districts, such as Cobalt, Ontario, present unique challenges for proponents and government regulators because of the cumulative nature of environmental impacts.

This project will develop geoscience methods for distinguishing the environmental effects of new mining activity from the complex existing background conditions in affected watersheds. The methods will improve the ability of developers and regulators to carry out or review environmental assessments.

Specifically, the project will develop means of reconstructing the history of accumulated polymetallic contamination from multiple sources over multiple periods. These new tools and new data from mine wastes and mine drainage will provide the first synthesis of the geochemical characteristics of silver-nickel-cobalt-arsenic (Ag-Ni-Co-As) vein type deposits.

Project results will be disseminated to key end-users to improve their capacity to carry out or review environmental assessments. The new knowledge will ensure that decision-makers have a better understanding of the cumulative nature of environmental impacts for the sustainable development of natural resources.

EXPECTED OUTCOMES

The objectives of this project are to develop and demonstrate leading-edge quantitative tools for cumulative environmental effects assessments in watersheds affected by mining. These tools will help end-users influence the development of mining environmental regulations or policies that are scientifically sound and effective in order to minimize risks to the environment. Investigations will focus on the historical Cobalt camp in Ontario, at which a century of mining has left a legacy of mine wastes and pervasive contamination in soils, sediments and waters of regional watersheds.

The project will consider problems such as:

- What was the pre-mining geochemical signature of these mineralized watersheds and how does this compare to environmental guidelines?
- Has the geochemistry of the watersheds adapted to past mining contamination and reached a state of equilibrium?
- Will new mining activity disrupt any existing geochemical equilibrium within the watersheds?
- Will climate change disrupt any existing geochemical equilibrium within the watersheds?
- In assessing the cumulative effects of metal contamination, are there impact thresholds that need consideration?

These questions will be addressed by developing new geochemical, mineralogical, isotopic, and micro-paleontological tools. The tools will be used to characterize pre-mining background conditions and current baseline conditions associated with past industrial activity. The tools will also fingerprint emissions from new mining operations to help support risk assessments and environmental monitoring activities.

PARTNERS

This project involves scientists from several divisions of the Geological Survey of Canada (GSC-Northern, GSC-Atlantic, GSC-Calgary) and collaborators from CanmetMINING, Health Canada, the University of Ottawa, and Queen's University (Canada).

CONTACT

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