



## CANMET MINING AND MINERAL SCIENCES LABORATORIES

# Mine Closure and Rehabilitation



### Program objectives

The objective for this research area is to develop reliable and cost-effective technologies to remove contaminants from mine effluents and process streams, enabling industry to meet regulatory requirements. These technologies involve the use of chemical, biological and physical methodologies, alone or in combination.

### Expertise

Experts in inorganic chemistry, chemical engineering, hydrometallurgy and biotechnology work collectively to treat mine, mill and metallurgical effluents. The program has applied its expertise in biotechnology to develop processes for the removal of metals, thiosalts and various nitrogen-containing compounds, and develop bioleaching applications for processing low-grade sulphide ores. Membrane technology, a new area being developed, has the potential to produce very clean effluents and increase recycling of process water.

### Key research areas

#### Integrated approaches

- state-of-the-art technical approaches to the prediction of metal leaching and acid rock drainage
- effluent treatment and mine rehabilitation

#### Biotechnology

- characterization of microbial populations by using advanced DNA fingerprinting techniques
- natural degradation processes and remediation options (e.g. passive treatment systems)
- application of bioreactors (e.g. rotating biological contactors, sequencing batch reactors) to gold mill and mine effluent treatment
- bioleaching of low-grade nickel ores

#### Membrane separation technology

- includes treatment of effluents and process solutions that contain ammonia, sulphate and dissolved metals

### Contact Us

This research is part of CANMET-MMSL's broader plan to foster sustainable growth in Canada's mining and mineral industry. To work with us, contact

[www.nrcan-rncan.gc.ca/mms-smm/tect-tech/index-eng.htm](http://www.nrcan-rncan.gc.ca/mms-smm/tect-tech/index-eng.htm)

CANMET Mining and Mineral Sciences Laboratories, Natural Resources Canada  
555 Booth Street, Ottawa ON K1A 0G1  
Business Office Tel.: 613-992-7392 Business Office Fax: 613-947-0983  
Program Tel.: 613-992-7286 Program Fax: 613-996-9041  
E-mail: [canmet-mmsl@nrcan-rncan.gc.ca](mailto:canmet-mmsl@nrcan-rncan.gc.ca)

Cat. No. M39-126/3-2009 (Print)  
ISBN 978-1-100-50378-3

Cat. No. M39-126/3-2009E-PDF (On-line)  
ISBN 978-1-100-14060-5

Her Majesty the Queen in Right of Canada, 2009



Recycled paper