

Green Mining Initiative Mines Vertes

16th Annual BC MEND ARD/ML Workshop
by Louise Laverdure, Natural Resources Canada

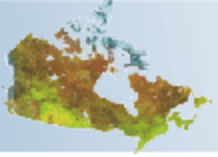
December 3, 2009



Natural Resources
Canada

Ressources naturelles
Canada

Canada



Outline

- Background
 - Issues and considerations
 - Why do we need to innovate
- Green Mining Initiative
 - Footprint reduction
 - Innovation in waste management
 - Ecosystem risk management
 - Mine closure and rehabilitation
- The Future





Objectives

- To outline a new, Pan-Canadian multi-stakeholder mining S&T initiative that will:
 - Improve the mining sector's environmental performance;
 - Promote innovation in mining; and,
 - Realize market opportunities in green mining technologies
- Recognized by Ministers at last F/P/T Conference in 2009

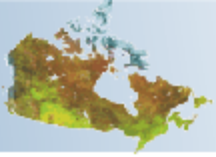




Mining environmental performance has greatly improved . . .

- Management of acidic drainage
 - New prediction, prevention and treatment methods have dramatically reduced environmental liabilities.
- Reduced emissions of air pollutants
 - SO₂ emissions reduced by 63% (1988-2006)
- Improved waste management
 - Improved closure methods – with current and new mines having closure plans and financial assurance
- Industry leadership
 - e.g. The Mining Association of Canada's *Towards Sustainable Mining*, PDAC's e3





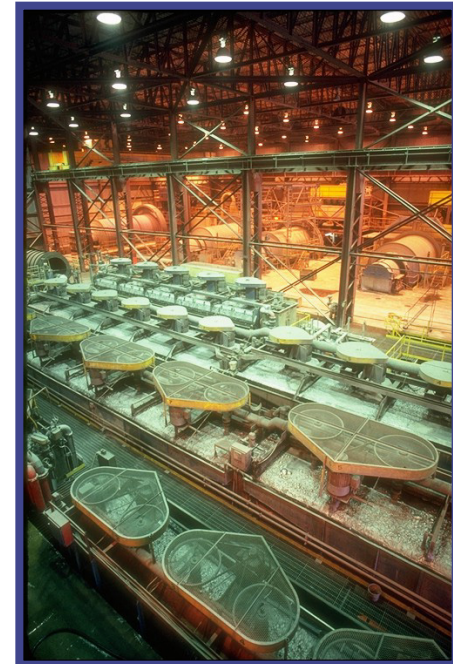
... but ongoing improvement is essential for long term competitiveness and environmental sustainability ...

- Use of fish-bearing water bodies for mine waste storage
- Regulatory standards tightening for GHGs, air pollutants, and water effluents
- Concerns about water supplies, acidic drainage and mine waste management
- Need for improved mine site rehabilitation
- Need to consider the impact of climate change on mining
- Canada expects better from us



Green Mining Initiative

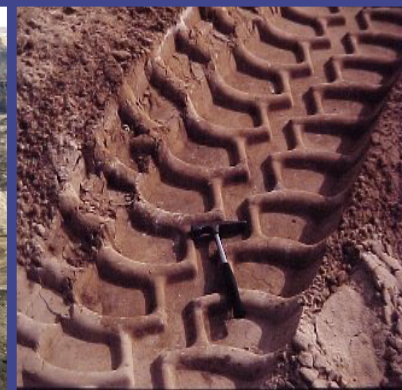
- Interconnected themes linked to environmental protection, remediation and recovery
 - Footprint reduction
 - Innovation in waste management
 - Ecosystem risk management
 - Mine closure and rehabilitation





Footprint Reduction

- Ore extraction methods
- Alternative energy vehicles
- Comminution
- Value added mineral by-products
- Clean processing
- Air emissions
- Alternatives to cyanide
- Biohydrometallurgy technologies





Innovation in Waste Management

- Waste minimization, utilization, reprocessing
- Acidic drainage, prediction of impact, prevention, and treatment, e.g. MEND
- Development of alternative waste disposal technologies
- Waste management practices and technologies for the North





Ecosystem Risk Management

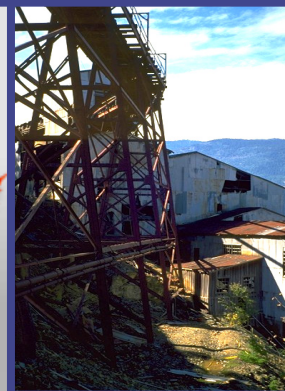
- Metals hazard and risk assessment
- Metal toxicology
- Environmental effects monitoring
- Transformation/dissolution (T/D) examination of metals, metal compounds and alloys
- Life Cycle Assessment of metals
- Development of water quality guidelines





Mine Closure and Rehabilitation

- Sustain multi-stakeholder initiative on abandoned mines (NOAMI)
- Technologies for mine closure and rehabilitation
 - climate change adaptation in the mining industry
 - ecological reclamation / habitat restoration
 - biodiversity





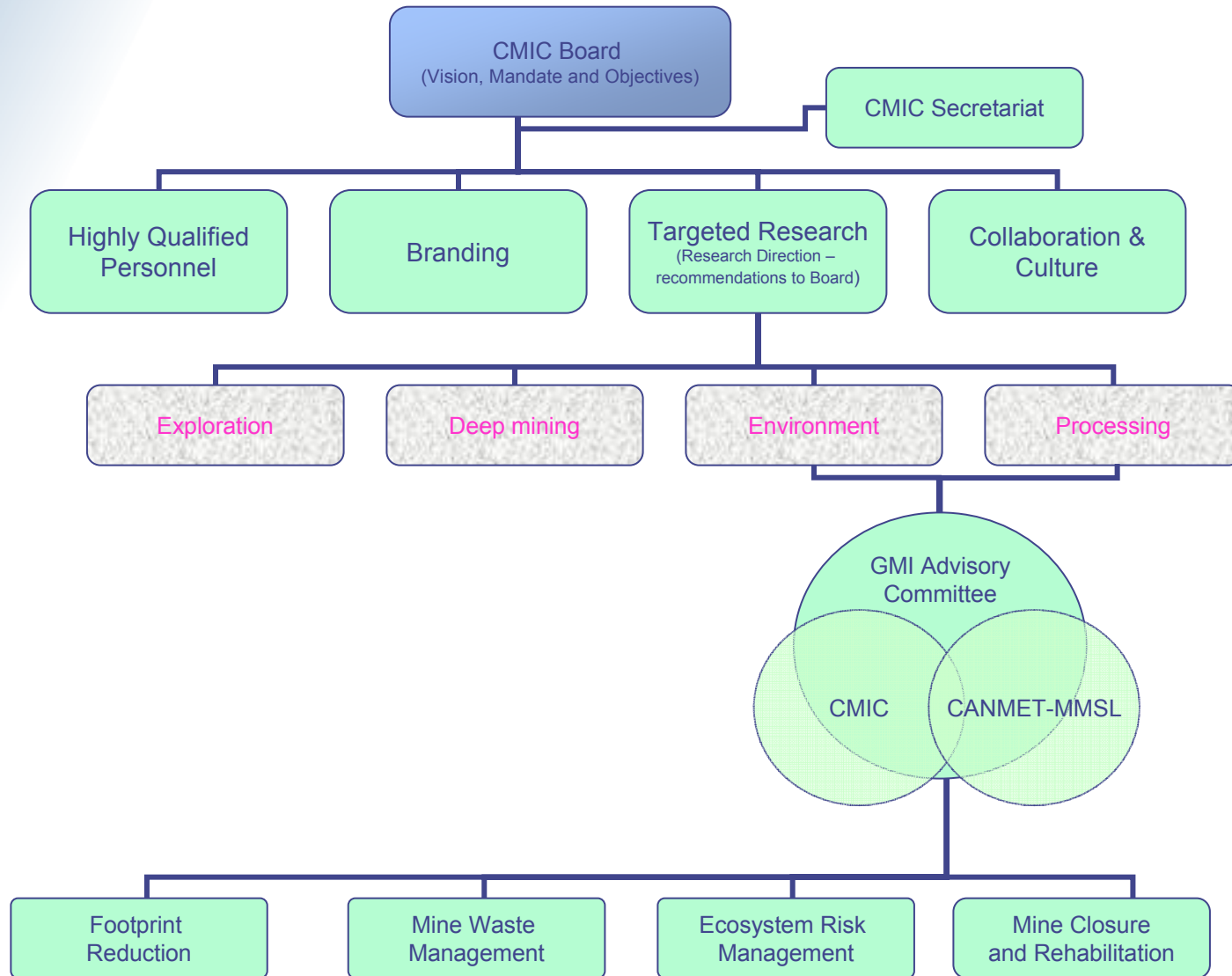
Making progress-Strengthening partnerships

- **Building on existing initiatives**
 - Mine Environment Neutral Drainage (MEND)
 - National Orphaned/Abandoned Mines Initiative (NOAMI)
- **Canada Mining Innovation Council (CMIC)**
 - CMIC endorsed the GMI under its environment theme
 - Joint CMIC-NRCan technical advisory committee
 - Joint initiatives on energy efficiency, tailings management
- **Opportunities for collaboration (domestic & international)**
 - 2009 EMMC FPT Ministers endorsement of GMI; public policy measures to advance green technologies
 - Industry, academia, research organizations





CANMET Mining and Mineral Sciences Laboratories





CMIC Environment Priorities

- CMIC has endorsed GMI as the tool to deliver its Environment related mandate.
- CMIC has two priorities under this mandate:
 - Tailings management
 - Energy Efficiency
- CMIC, in collaboration with NRCan, is organising workshops on these two issues.





The Future...

- Minimize waste produced by mining, transform it into environmentally friendly resources for other uses and leave behind only clean water, rehabilitated landscapes and healthy ecosystems.
- Canada's future will need us to demonstrate leadership in green mining
- A Canadian mining industry that is, and is seen to be, innovative, as well as environmentally and socially responsible

