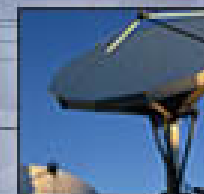
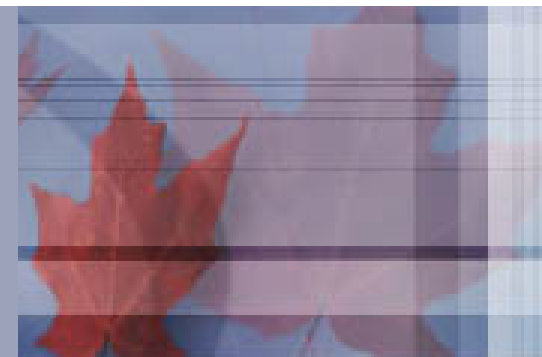


Update of MEND and NOAMI

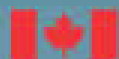


CANADA'S NATURAL RESOURCES

NOW AND FOR THE FUTURE

www.nrcan.gc.ca

Gilles Tremblay – MEND Secretariat
12th BC/MEND ML/ARD Workshop
Vancouver, 2005



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Presentation Highlights

- Mine Environment Neutral Drainage (MEND)
- National Orphaned/Abandoned Mines Initiative (NOAMI)



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Mine Environment Neutral Drainage (MEND) Program



Raglan



Natural Resources
Canada

Ressources naturelles
Canada

Canada

MEND Steering Committee

- Kim Bellefontaine – BC
- Gilles Tremblay (Secretariat) - NRCan
- Ernie Armitt – Manitoba
- Louis Bienvenu - Québec
- John Robertson - Ontario
- Ross Gallinger – Placer Dome (INAP)
- Bill Price – NRCan
- John Martschuk - Barrick
- Elizabeth Gardiner - MAC
- Mike Aziz – Placer Dome
- Chris Doiron - EC
- Catherine Coumans - MiningWatch Canada
- Denis Kemp – Falconbridge
- Amy Crook – Center for Science in Public Participation
- Charlene Hogan (Secretariat) - NRCan



Natural Resources
Canada

Ressources naturelles
Canada

Canada

MEND Projects - Completed

Covers for Permafrost (MEND 1.61.4)

Review of Water Quality Issues in Neutral pH Drainage (MEND 10.1)

Checklist – Factors to Consider in ML/ARD Mitigation Work (MEND 5.10E/F)

Case Studies in BC (MEND 9.1)

- MEND 9.1a Johnny Mountain Mine
- MEND 9.1b Sulphurets Mine
- MEND 9.1c Snip Mine



Natural Resources
Canada

Ressources naturelles
Canada

Canada

MEND Projects - Completed

Disposal Options for Lime Sludges (MEND 3.42.3)

Dry Covers Manual (MEND 2.21.4)

Five-volume set available in hard copy or CD-ROM:

1. Summary
2. Theory and Background
3. Site Characterization, and Numerical Analyses of Cover Performance
4. Field Performance Monitoring, Sustainable Performance of Cover Systems
5. Case Studies



Natural Resources
Canada

Ressources naturelles
Canada

Canada

MEND Projects - Completed

Case Study Assessment

- Dona Lake, ON (Placer Dome)
- Heath Steele, NB (Falconbridge)
- Mandy Lake, MB (HBMS)
- East Sullivan, QC (Québec)
- Lorraine, QC (Québec)



Heath Steele

Underground Paste Backfill

Compilation of available information on paste backfill

MEND Technology Transfer Workshops to Community Groups

- North American Indigenous Mining Summit, Edmonton
July 2005



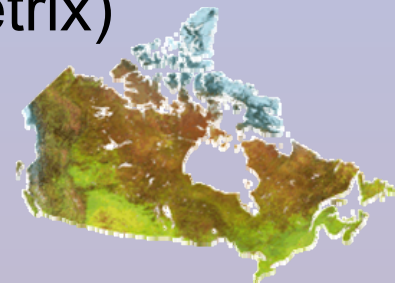
Natural Resources
Canada

Ressources naturelles
Canada

Canada

Ongoing MEND Projects

- **Prediction Manual** - Update of the Draft “BC Prediction Manual” to be published as national document (NRCan)
- **Performance of Dry Covers at the Macroscale i.e. watershed (O`Kane)**
 - Introduction and Background
 - Watershed Scale Monitoring Methods
 - Tracking Cover Evolution with Time
- **Literature Review on Impacts of Molybdenum and Selenium on Terrestrial Environment (EcoMetrix)**



Natural Resources
Canada

Ressources naturelles
Canada

Canada

MEND Projects in 2005

- **Cold Temperature Effects on Geochemistry (SRK)**
 - Evaluation of case histories to better understand geochemical mechanisms
- **Northern Soil Covers (SRK)**
 - Study on cold region phenomena that could impact on the performance of soil covers.
- **Symposium 2005 on Mines and the Environment, Rouyn-Noranda**
- **12th BC/MEND Workshop, Vancouver**



Natural Resources
Canada

Ressources naturelles
Canada

Canada



MEND Global Alliance Projects

- **Waste Rock Scale-up Project** at Diavik Diamond Mines
- **Global ARD Guide (GARD GUIDE)**
 - the development of a worldwide guide that captures and summarizes best science and a risk based approach to ARD management.



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Program Plans for 2006

- Budget of \$215 K for 2006
 - \$115K from MAC for research
 - \$100K for Secretariat (MAC \$50K; NRCan \$50K in kind)
- Plans to be finalized at December 2 meeting
 - Several proposals to be discussed including:
 - Louvicourt water cover project
 - Update of review of relevant legislation (4.2.1)
 - Update of the liability report by Feasby/Jones
 - Workshops for 2006
 - 7th ICARD (St. Louis, March 27 to 30, 2006)



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Mine Site Inventory Website



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Français	Contact Us	Help	Search	Canada Site
Home	About Us	What's New	MMS Site	NRCan Site



Home
Documents
Members
Discussion Board
Contacts
Links

Links

- [NOAMI](#) - National Orphaned /Abandoned Mines Initiative
- [Mine Environment Neutral Drainage](#)

Select Province

Submit

Mine ID	Comp	Status Active	Status Inactive	Status Care Maint.	Tailings Tonnes	Tailings Hectares	Tailings Method	Tailings Acid
Zenmac		?	1		165	20	raised stack	1
Young Davidson		?	1		6200	80	cross valley	2
Wright Hargreaves		1	1		10000	68	cross valley	2
Winston Minnova		1	1		2100	100	water covers	1
Wilmar					760			
Williams		1	1		10000	50	underwater	1
White		1	1		10000	50		2
Wendigo Gold		1	1		200	2	uncontained beach	1
Vipond		?	1		1500	24	side hill	2
Upper Canada		1	1		5000	150	cross valley	2



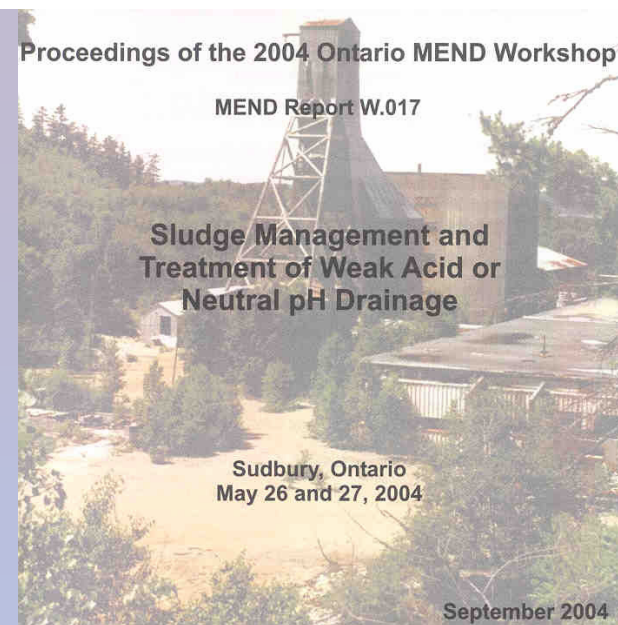
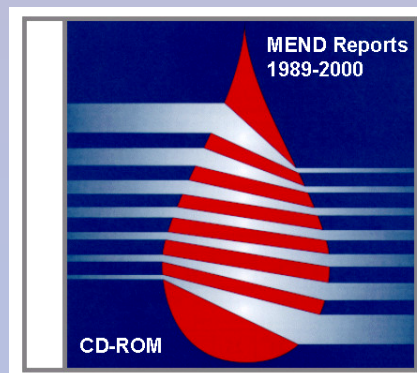
Natural Resources
Canada

Ressources naturelles
Canada

Canada

Technology Transfer

- The MEND Monitor
 - May 2005
 - September 2005
- Presentations (8)
- Workshops (3)
- Global Alliance
- MEND Website at: mend.nrcan.gc.ca
- Environment and Mine Wastes Management – Industrial NSERC Chair
- 7th ICARD St. Louis, Missouri
 - March 27-30 , 2006



The MEND Monitor

Sixth International Conference on Acid Rock Drainage (ICARD)

The 6th ICARD was held in Cairns, Australia from July 14-17, 2003. With its theme of "Application and Sustainability of Technology", the conference continued the tradition of previous ICARDS in providing an outlook of cutting-edge research and innovative technologies relevant to acidic drainage.

The conference proceedings provide a timely review of the innovative approaches that have been developed for the prediction, prevention, treatment and monitoring of acidic drainage. Proceedings, available only on CD-ROM, can be obtained from AusIMM. Consult their web site at www.ausimm.com.

The Global Alliance for acidic drainage research between INAP and Regional Organizations was announced at ICARD. Representatives from the partnering groups attended the conference and presented at the plenary session. Partners include, from left to right, Charles Backman (AETI), Ross Gullinger (BHP), Chair Operating Committee), Clive Bell (ACMER), Robin Robertson (BHP, Chair Board) and Gilles Tremblay (MEND).



Upcoming Events and Announcements

10th Annual British Columbia MLUARD Workshop: Characterization of Wastes, Changes in ARD, Generating Wastes and Recent MEND3 Projects. December 2 and 3, 2003 / Vancouver, BC. Additional information and the registration form are posted on the MEND web site.

Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities: Published by The Mining Association of Canada (MAC). Copies can be obtained through the MAC web site at www.mining.ca.

Further MEND Projects for 2003

Assessment of Disposal Options for Lime Sludge: State-of-the-art review and assessment of available disposal options for lime sludge. Options to be evaluated for feasibility, environmental impact and relative costs. Contractor: Natural Resources Canada.

Neutral Leaching: A review of mining operations in Canada to scope out the priority metals and chemicals of concern, potential challenges and cost implications associated with metal leaching under non-acidic conditions. Contractor: Stantec Consulting Ltd. (Brampton)

Case Study Assessments: An Environment Canada sponsored study to assess and verify the effectiveness of acidic drainage pollution prevention and control techniques. Phase I consists of assessing information for five Canadian mine sites. Phase II will center upon field investigations at two of these sites. Contractor: SNC-Lavalin Environmental Inc.

MEND3 Steering Committee Members

Mine Ace – Placer Dome Canada Ltd.
 Von Bredow – BC Ministry of Energy and Mines
 Louis Brevin – Ministère des Ressources naturelles, de la Faune et des Parcs du Québec
 Catherine Courcier – MiningWatch Canada
 (WR) Dick Cowan – Ontario Ministry of Northern Development and Mines
 Any Crook – Environmental Mining Council of BC
 Patrick Fréchet – Environment Canada
 Ross Gullinger – BHP Billiton Bauxite Metals
 Elizabeth Gendron – The Mining Association of Canada
 Denise Kemp – Noranda Inc. – Falconbridge Ltd.
 John Matheson – Bauxite Gold Corporation
 William (Bill) Price – Natural Resources Canada (NRCan)
 Christine Hogan (Executive) – NRCan
 Gilles Tremblay (Executive) – NRCan
 Please contact any of the above members for further information on MEND.

To obtain information on MEND, or its publications please visit our web site at the following URLs:
mend.nrcan.gc.ca or mendDWA.NRCan.gc.ca
 or send an e-mail to: mend_nodem@nrcan.gc.ca



Canada



Natural Resources
Canada

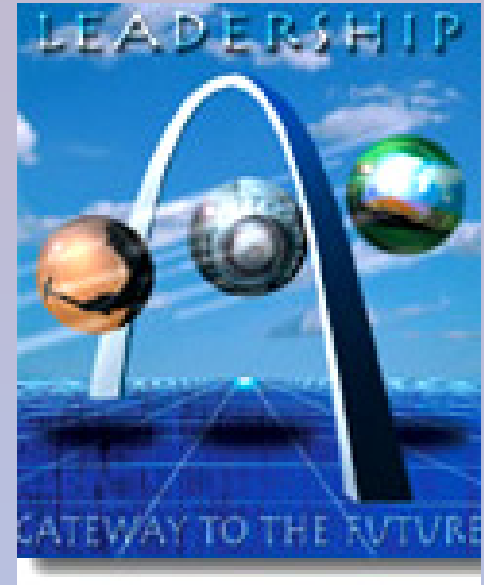
Ressources naturelles
Canada

Canada

7th International Conference on Acid Rock Drainage

March 27 – 30, 2006

St Louis, Missouri



DRAC-547



Natural Resources
Canada

Ressources naturelles
Canada

Canada

National Orphaned and Abandoned Mines Initiative - (NOAMI)



North Coldstream Mine - Burchell Lake, ON



Natural Resources
Canada

Ressources naturelles
Canada

Canada

NOAMI



- Multistakeholder partnership
- Five task groups overseeing prioritized projects:
 - Information Gathering
 - Community Involvement
 - Barriers to Collaboration
 - Funding Approaches
 - Jurisdictional Legislative Review



Natural Resources
Canada

Ressources naturelles
Canada

Canada

NOAMI Highlights

- Report on case studies examining issues related to **community involvement** and publication of guidelines (pamphlet) for meaningful community engagement
- Report, workshop and summary recommendations on **legislative and institutional barriers** to voluntary remediation
- Report and summary recommendations on **funding approaches** for orphaned/abandoned mines



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Information Gathering

- Capacity building for a national inventory
 - Review of Canadian and international inventories completed
 - Database delivery model proposed
 - Web-based and map interface (MapGuide)
 - Umbrella (index style) system
- National definition for an “orphaned and abandoned mine site” proposed
- NRCan selected as host for the inventory



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Jurisdictional Legislative Review (JLR)

- Study initiated in May, 2005. Contractor is Joseph Castrilli (Barrister & Lawyer)
- Focused review of the legislative/regulatory/policy framework respecting collaboration, liability and funding measures in relation to orphaned/abandoned, contaminated and operating mines for the various jurisdictions across Canada



Natural Resources
Canada

Ressources naturelles
Canada

Canada

JLR Progress to Date

- Draft completed for: federal, all provinces, and all territories
- Jurisdictional leads required for consultation and co-ordination of review in: BC, NL, NU
- Next steps: To assess the findings of the report with respect to gaps, limitations, barriers and opportunities and to develop recommendations to facilitate O/AM reclamation across Canada



Natural Resources
Canada

Ressources naturelles
Canada

Canada

NOAMI in 2005

- Workshop on Assessing Liabilities and Funding Options held in Ottawa on November 2-3, 2005
 - Case Studies
 - Technical Site Assessments
 - Accounting and Reporting on Liabilities
 - Perspectives on Assessing Community and Health Impacts
 - Funding Options



Natural Resources
Canada

Ressources naturelles
Canada

Canada

NOAMI in 2006

- Best Practices workshop planned for Winnipeg in June
- Jurisdictional Legislative Review final report on CD-ROM to be released
- Working model of inventory (portal) with data from three provinces by March (PDAC)
 - visual, high-level summary of data
 - interactive links to allow for near-transparent transition into more detailed information
 - can include spatially related features and satellite imagery



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Information Transfer

- NOAMI News
- Presentations
- Pamphlet
- Reports
- Workshops
- Conferences
 - Trade exhibits
- NOAMI Web site at:
www.abandoned-mines.org



April 2004

NOAMI NEWS

NOAMI Chair Receives 2004 Environmental Award from the Proponents & Developers Association of Canada (PDAC)

Christine Kaszoki, Assistant Deputy Minister in Manitoba's Industry, Economic Development and Mines Ministry, received the PDAC Environmental Award in recognition of her work and achievements in NOAMI. As chair of NOAMI, Dr. Kaszoki has tirelessly and wisely spearheaded, managed, and promoted this important environmental program.



Incoming PDAC President Peter Dwyer presents Environmental Award to Christine Kaszoki

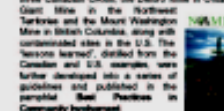
New in NOAMI in 2004

The Task Group on Guidelines for Legislative Review was formed with the objective "to complete guidelines for jurisdictional legislative reviews with respect to collaboration, liability and funding for orphaned/abandoned mines (OAMs) in Canada". These guidelines will be used to assist in the development of a consistent, transparent, coordinated and efficient legislative framework for the management of OAMs.

What's on the Web Site

Potential Funding Approaches for Orphaned/Abandoned Mines in Canada (2003). This report outlines a variety of funding approaches that could be considered for cleaning-up or managing liabilities related to OAMs in Canada. Advantages and disadvantages of each approach are evaluated and preferred options are identified.

Lessons Learned On Community Involvement in the Remediation of Orphaned/Abandoned Mines: Case Studies and Analysis (2003). This report examined the community involvement processes at three Canadian OAMs: the Deloro Mine in Ontario, Giant Mine in the Northwest Territories, and the Mount Washington Mine in British Columbia, along with contaminated sites in the U.S. The "lessons learned" distilled from the Canadian and U.S. examples were further developed into a series of guidelines and published in the pamphlet *Best Practices in Community Involvement*.



Barriers to Collaboration: Orphaned/Abandoned Mines in Canada (2003). Existing legislative requirements were examined for Canada, selected U.S. jurisdictions, and other countries on regulatory or institutional barriers, liability, resources, and collaborative opportunities regarding voluntary abatement, remediation, and reclamation of OAM lands.

Workshop on Legal and Institutional Barriers to Collaboration: Meeting in OAMs - Ottawa, ON February 24 - 25, 2003. Presentations were made that detailed experiences in Canada and the U.S. on existing and alternative legal and administrative mechanisms that have been applied to third party clean up. Promises and priorities were identified for addressing the barriers, and preferred options were discussed that would allow third parties to collaborate or clean up and to manage liabilities related to OAMs.

These reports and other publications can be downloaded from our web site at:
www.abandonedmines.org



For further information on NOAMI, please contact Gillie Tremblay (Secretary), at Tel: (877) 952-2998 or abandoned_mines@ec.gc.ca



www.msha.gov



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Mine Environment Neutral Drainage
(MEND)

mend.nrcan.gc.ca



International Network on Acid
Prevention

www.inap.com.au



National Orphaned and Abandoned
Mines Initiative (NOAMI)

www.abandoned-mines.org



Natural Resources
Canada

Ressources naturelles
Canada

Canada



Happy
Xmas



Natural Resources
Canada

Ressources naturelles
Canada

Canada