

## **13<sup>th</sup> Annual BC/MEND Metal Leaching and Acid Rock Drainage (ML/ARD) Workshop**

The theme of the 13<sup>th</sup> Annual BC/MEND Metal Leaching and Acid Rock Drainage (ML/ARD) Workshop was ‘Challenges with Open Pits and Underground Workings’. The workshop was held on November 29 and 30<sup>th</sup>, 2006 in Vancouver, British Columbia. There were 27 presentations, including case studies of drainage chemistry prediction, flooding, waste disposal and mitigation. Presentations included mine sites from across Canada plus several sites from the USA, Australia and Germany. Key outcomes of the workshop included:

- There are many physical, hydrological, geochemical and biological properties and processes that potentially affect geochemical performance of open pits and underground workings, and many of these properties and processes are dynamic. Many mines with flooded pits and underground workings produce acceptable drainage chemistry, however in some locations there is uncertainty whether drainage chemistry will remain acceptable in the long term.
- In some instances mine workings can be used to reduce environmental liabilities, risks and costs, by serving as treatment and waste storage facilities. However, issues that could affect geochemical performance include wall failures, changes in hydrogeology and uncertainties with respect to atmospheric conditions. Additional safety factors should be considered to account for limitations in the precision and accuracy of predicted performance.
- Detailed hydrogeological assessments should be conducted to determine whether open pits and underground workings are suitable for waste storage.
- Where discharge conditions are suitable, bioremediation shows considerable promise as a procedure for lowering trace element concentrations in pit lakes with neutral pH. However, sustained, effective long-term treatment requires considerable monitoring, maintenance and amendments.
- Models can provide useful guidance as to possible outcomes and processes. However, due to the complexity of physical, hydrological, geochemical and biological processes, appropriate lab and field “pilot-scale” testing is recommended to test performance hypotheses prior to whole-pit implementation. As well, follow-up monitoring is required to verify predictions and fill-in information gaps.

Several BC MEMPR and MEND resource documents may assist practitioners in drainage chemistry assessment, including:

- *BC MEMPR Draft Manual of Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia, by W. A. Price (March 1997)* - Also referred to as Prediction Manual.
- *MEND 5.10 List of Potential Information Requirements in Metal Leaching/Acid Rock Drainage Assessment and Mitigation Work (January 2005)* - A checklist to ensure all assessment issues are addressed; available on the MEND web site in both official languages.

- *MEND 2.36.1 Review of In-Pit Disposal Practices for the Prevention of Acid Drainage – Case Studies (September 1995).*
- *MEND 9.1a ML/ARD Assessment and Mitigation at the Johnny Mountain Gold Mine (August 2004).*
- *MEND 9.1b Case Studies of ML/ARD Assessment and Mitigation: Snip Gold Mine (June 2005).*
- *MEND 9.1c Case Studies of ML/ARD Assessment and Mitigation: Placement of the Sulphurets Waste Rock in Brucejack Lake (July 2005).*

The workshop concluded with presentations on new developments. Gilles Tremblay gave an update on the activities of MEND and NOAMI. Terry Chatwick, the recently appointed Technical Manager for INAP gave an update on the INAP program. Ricci Berdusco, Acting Chief Inspector of Mines for British Columbia, presented the technical results from the ongoing investigations of the Sullivan accident. Lastly, Eileen Doody and Rhoda Quock of the Iskut First Nation, presented a First Nation's perspective on the many large scale mining and oil and gas projects planned for their traditional territory and how these multi-billion dollar projects will affect their quality of life.

The BC/MEND workshop proceedings for 2006 (as well as previous years proceedings) are available for purchase from [www.bitech.ca](http://www.bitech.ca), with several distributed by MEND. Please visit the MEND website at <http://mend.nrcan.gc.ca> for more information on MEND publications and ongoing projects.

As always, comments and suggestions regarding this and future workshops are welcomed!

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## **ACKNOWLEDGMENTS**

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Thanks to Gilles Tremblay and Charlene Hogan of the MEND program who were responsible for most of the advertising and pre-workshop registration. Gilles Tremblay, Elizabeth Gardiner (Mining Association of Canada, Chair of MEND Steering Committee), Bill Price (NRCan) and Kim Bellefontaine (BC MEMPR), are acknowledged for chairing portions of the workshop. Carol Howell of BC MEMPR expertly handled logistical issues associated with the workshop and managed the on-site registration. Jozsef Miskolczi and Judy Andrina from UBC provided great assistance with registration and were responsible for all the successes in the audiovisual department.

Most importantly, thanks to the speakers, especially those from other parts of Canada and the world, who volunteered their time. And thanks to the audience who contributed much to the enlightening discussion that followed each presentation.