

**Appendix A-3**  
**Transparencies/Papers Presented in Plenary Session**

**3.13 Case Study: Toxicity Control: The Dome Mine Saga (1992–1999)—Ron Connell  
(Placer Dome)**




**3.14 Case Study: Toxicity Identification/Reduction Evaluation (TI/RE) for Inco Port Colborne—Lesley Novak (ESG International) with David Reed (Inco)**

**Toxicity Identification/Reduction  
Evaluation (TI/RE)  
for INCO PCR**

**ESG International**

### **3.15 Case Study: Inco's Copper Cliff Waste Water Treatment Plant—Glen Watson (Inco)**

**3.16 Case Study: Battle Mountain Gold's Holloway Mine—Walter Sencza (Battle Mountain Gold)**



**Battle Mountain Gold**

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# **Holloway Mine**

**Presentation by Walter Sencza**

**Toxicological  
Investigation  
Mining  
Effluents**

Nov 25-  
26, 1999  
Ottawa,  
Ontario

**Setting A New Gold Standard**

3.17 Case Study: Falconbridge's Kidd Creek and Raglan Properties—Bernie Swarbick (Falconbridge)

*Toxicity - Kidd Program*

*Kidd Metallurgical site :*

*Source of emissions*

- *Tailings*
- *Mill effluent*
- *Site Runoff*



Falconbridge Ltd. Kidd Metallurgical Division



SOCIÉTÉ MINIÈRE RAGLAN DU QUÉBEC LTÉE

*Case Study:*  
*Falconbridge - Raglan Mine*



### 3.18 The TIME Network—Elizabeth Gardiner (Mining Association of Canada)

#### **DRAFT AMENDED MMER**

Apply to all metal mines, except placer gold.

Acutely lethal effluent is a deleterious substance.

“Acutely lethal” - effluent at 100% concentration kills more than 50% rainbow trout in a 96-hour period when tested.

Implementation timelines:

Jan. 2001 - reporting  
Dec.2001 - Trans. Auth.  
Jan. 2002 - MMER in effect  
Dec.2002 - Trans. Auth. end  
Jan. 2003 - MMER - all mines

#### **ACUTE LETHALITY: INTERIM PROGRESS**

National toxicity partnership program approved in principle by MAC Board, June 2, 1999

July 8, 1999 Meeting in Toronto.

Participation/input from:

- Industry - HBM&S, Inco, Noranda, Falconbridge, Lakefield Research, Cominco, Placer Dome, MAC, OMA\*
- Government(s) - Environment Canada, Natural Resources Canada, MNDM, Ontario MOE
- Consulting - ESG International

\*later joined by Teck, Battle Mountain

## **INTERIM PROGRESS (cont'd)**

Results of July 8<sup>th</sup> meeting:

- “TIME” (Toxicological Investigations of Mining Effluents) - multistakeholder national toxicity initiative
- TIME Task Force or Advisory Committee - guide priorities, work plan, budget, time lines etc.
- November 25-26 workshop in Ottawa
- CANMET Secretariat - services to TIME Advisory Committee and Network
- partial preliminary work plan

### **“TIME” OBJECTIVES**

Provide the time and resources to:

- analyze the data to determine those mines that can identify causes/sources of effluent toxicity;
- develop an appropriate methodology to identify causes/sources and reduce or eliminate toxicants; and
- develop economical treatment technologies to consistently achieve non acutely lethal effluent

Participants:

Industry, Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada, NGOs, consultants and academia as required



## **“TIME” WORK PLAN (1)**

- November 25-26 1999 Workshop, Ottawa
  - about 60 participants (multistakeholder)
  - costs shared by Environment Canada, NRCan (CANMET) and MAC
  - discuss challenges, successes, timelines, issues, work priorities
- Priority Projects (partial list): Year One (2000)
  - (1) NALMET (Non Acutely Lethal Mining Effluent Techniques) - funded by Environment Canada (\$150K)
  - (2) Assessment of ammonia toxicity, best management practices (BMP) and treatment options (\$35K)
  - (3) Manual for toxicity identification/reduction evaluation (TI/RE) for Canadian mine sites (\$50-75K)
  - (4) Inventory of toxicity problems across Canada (\$35K)
  - (5) Literature review on best available technology (\$10K)

## **“TIME” WORK PLAN (2)**

- THREE-YEAR PROGRAM; ANNUAL REVIEW AND APPROVAL BY MAC BOARD
- ESTIMATED ANNUAL COST OF \$175,000
- ADDITIONAL FUNDS FROM OTHER SOURCES? (ex., non-MAC companies, other industrial sectors, government(s))
- ADVISORY COMMITTEE FORMALIZED JANUARY 2000
- WORK TO BEGIN IMMEDIATELY

## **IN THE INTERESTS OF “TIME”...**

- aid in obtaining Transitional Authorizations under MMLER
- compliance with amended MMLER
- cost-effective, definitive approaches to accurately and consistently identify cause(s) of toxicity
- reduce cost and uncertainty over long term
- increase data and knowledge regarding the chemistry and toxicology of contaminants in mining discharges (metals, including rare metals, total dissolved solids, process chemicals) and enhance data interpretation
- better prepare for sublethal (chronic) toxicity testing and environmental effects monitoring (EEM)
- anticipate and contribute to international initiatives (setting of protocols etc.)
- demonstrate proactive commitment and due diligence by industry
- build trust and credibility with other stakeholders

**3.19 Non-Acutely Lethal Mining Effluent Technologies (NALMET)—  
Patti Orr (Beak International Inc.)**

**NON ACUTELY LETHAL  
MINING EFFLUENT TECHNOLOGIES  
(NALMET)**

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Patti Orr, M.Sc.  
Beak International Incorporated  
Brampton, Ontario



### **3.19 Summary – Comments and Questions**

1. How many mines are still experiencing a fairly consistent toxicity problem or are we dealing with the more difficult circumstance of episodic toxicity?
2. For mines that still have a toxicity problem, the information we have indicates that the toxicity is primarily caused by ammonia (RBT) and Cu and/or TDS(Daphnia).
3. What would you suggest in terms of a treatability evaluation where ammonia is the main toxicant that would truly advance the current state of knowledge?
4. What other toxicants are known to be causing RBT toxicity, and are there any mines experiencing this problem that would be willing to participate in this study (Free R&D, anonymity assured)?
5. Are there any other suggestions as to how this study could be made more relevant or useful in terms of addressing the outstanding toxicity compliance issues?

3.19 Non–Acutely Lethal Mining Effluent Technologies (NALMET)—Patti Orr  
(Beak International Inc.)

