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## CANMET's Abandoned Mines Program

Presentation to the U.S. Interstate Technical Group  
on Abandoned Mines  
May 1-3, 2002  
Dr. Marc C. Bétournay

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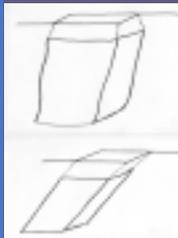
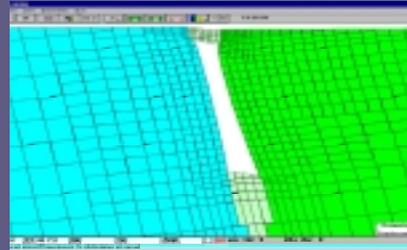
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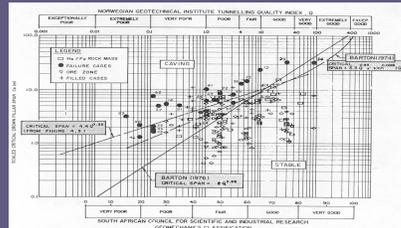
## Previous Coverage

Development of  
Engineering Techniques

-  failure mechanisms
-  empirical, analytical and numerical analysis techniques
-  application of monitoring techniques



$$F_s = \frac{\sum_{i=1}^n c_i A_i + \left( \frac{\sum_{i=1}^n \alpha_i A_i}{V_{PG}} - \frac{\gamma(H-d)^2 b}{3} \right) \tan \phi_i \sin \psi}{V_{PG} + \left( \frac{\sum_{i=1}^n \alpha_i A_i}{V_{PG}} - \frac{\gamma(H-d)^2 b}{3} \right) \cos \psi}$$



$$C_s = L \left( \frac{\gamma}{t(1+L/S)(1-0.4 \cos \psi)} \right)^{0.5}$$

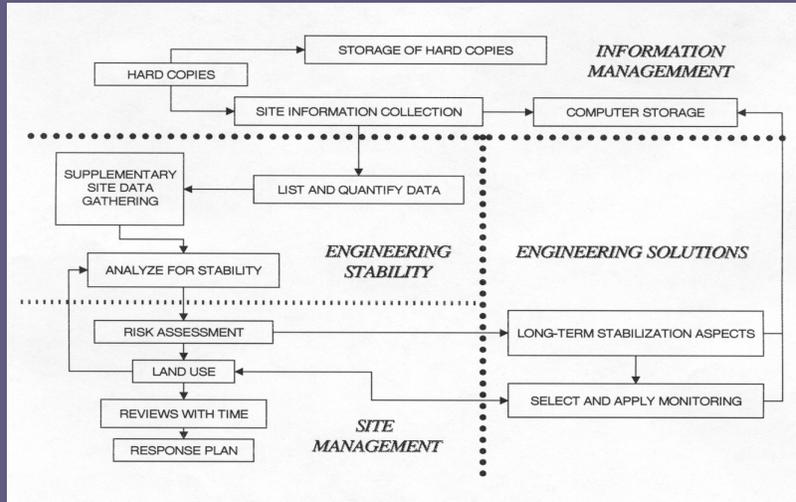
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# Previous Coverage

## Minesite Decommissioning Standard



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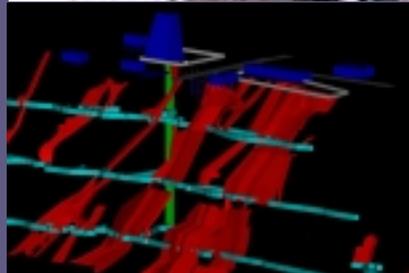
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# Previous Coverage

## Development of a Database

-  most hazardous sites
-  preservation of original text and visual documents
-  reconstruction of site elements

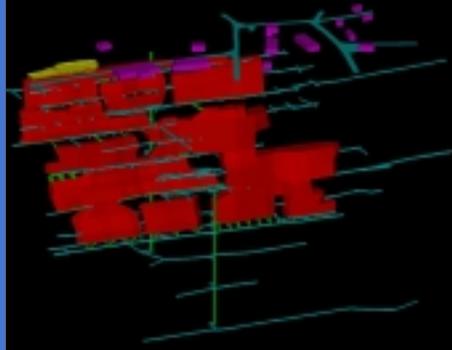


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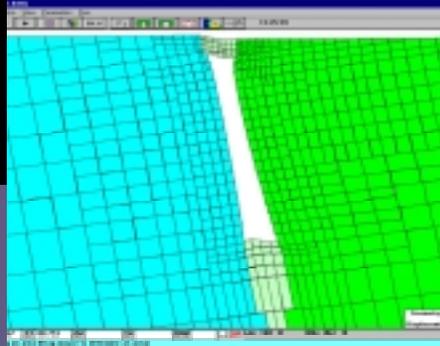
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## Previous Coverage



Case Studies



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## Affected Infrastructure Project

-  Highways
-  Rail lines
-  Gas pipelines
-  Housing
-  Town streets
-  Tailings sites
-  Water courses



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## Affected Infrastructure Project (ctd)

### Impacts

- Prevents unwanted infrastructure expenditures
- Better planned building projects on minesites
- Continuation of services
- Better risk quantification
- Red flag/prioritize sites
- Remediation can be better designed



$$R = Px \cdot Cx$$

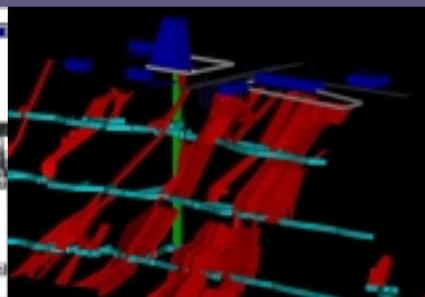
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## Database Update

- Expand to internet database access
- Better GIS and spatial coverage
- More application of overlays
- Include reference case studies (decommissioning plans, infrastructure coverage, real time monitoring data)
- Repertoire of hazardous sites and risk levels



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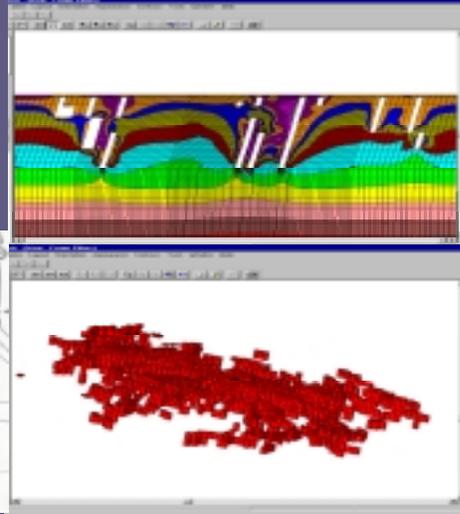
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## Case Studies

### Application of Large Scale Modelling

- Regional destressing from mining, facilitating gravity failures of hard rock mines
- Highway integrity



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## Summary

The CANMET Abandoned Mines Program will continue to:

- Apply engineering methods to define fundamental aspects of rock mass behaviour
- Apply engineering methods to quantify site behaviour
- Develop methods to understand and define the interaction between rock mass and surface aspects



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