IMPROVEMENTS TO REGULATORY OVERSIGHT OF TSFs IN BRITISH COLUMBIA

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PRESENTATION OUTLINE

- Mining in British Columbia (BC)
- Mount Polley Dam Failure
- Immediate Response
  - Investigations
  - Chief Inspector of Mines (CIM) Directives
- Findings and Recommendations
- Legislative and Regulatory Changes
- Organizational Changes
- Engagement and Transparency
MINING IN BRITISH COLUMBIA PROVINCE

- $9.7B production value in 2018
- More than 30,000 employed in mineral exploration, mining and related sectors
- Coal (39%), copper (35%) and gold (7%) are major products
- Open pit and underground operations
- 98 Tailings Storage Facilities (TSFs) at 61 permitted mines
MOUNT POLLEY DAM FAILURE
AUGUST 4, 2014
IMMEDIATE RESPONSE
IMMEDIATE RESPONSE

INVESTIGATIONS LAUNCHED

1) Independent Expert Engineering Investigation and Review on Mount Polley (January 2015)

2) Chief Inspector of Mines' Investigation on Mount Polley (November 2015)

3) Joint Conservation Officer Service – Federal Department of Fisheries and Oceans Investigation (Ongoing)
IMMEDIATE RESPONSE

CHIEF INSPECTOR OF MINES (CIM) DIRECTIVES

1. Issued August 2014:
   - Dam Safety Inspection
   - 3rd Party Review
   - Mine Manager Commitment Letter
   - Emergency Preparedness and Response Plan (EPRP)/Testing
   - Dam Break and Inundation Study

2. Issued February 2015:
   - Undrained shear failure of silt and clay foundations
   - Water balance adequacy
   - Filter adequacy
FINDINGS & RECOMMENDATIONS
At the time of the incident, the OAG was already conducting an audit of compliance and enforcement in the mining sector.

• The main recommendation: “...create an integrated and independent Compliance and Enforcement unit...”

• 16 additional sub-recommendations
43 recommendations resulted from the two Investigations and the Audit. All recommendations have been accepted by BC Government and continue to be implemented.

Remainder of presentation will outline how these recommendations have been applied.
LEGISLATIVE AND REGULATORY CHANGES
The province of British Columbia utilizes a Professional Reliance model.

The Regulator relies on the technical expertise and professional opinion of external professionals.

The Regulator does not direct design and is not prescriptive with respect to specific technologies etc.

The role of the Regulator is to evaluate that the design, construction, operation and closure meet the intent of the legislation and regulations.
LEGISLATIVE AND REGULATORY CHANGES

LEGISLATIVE REVISIONS TO THE MINES ACT

- Administrative Monetary Penalties (AMPs)
- Increased timeframe to commence prosecution (from 1 to 3 years)
- Enable court prosecution and fines of up to $3,000,000 or 3 years in jail
LEGISLATIVE AND REGULATORY CHANGES

CODE REVIEW

- Mining in BC is governed by The Health, Safety and Reclamation Code for Mines in BC (and the Mines Act)
- The Code provides a structure like a regulation enabled by the Mines Act
- Tailings section revised in 2016
- Revisions were developed by a committee composed of members from government, industry, labour unions and First Nations
- Opportunity for public input prior to Code revisions
Engineer Of Record

- Registered Professional Engineer required for every TSF and dam
- Assure TSFs and dams have been designed and constructed in accordance with applicable guidelines, standards and regulations
- Carries out:
  - Annual Dam Safety Inspections (DSIs)
  - Participates in Dam Safety Reviews (DSRs) and risk assessments
  - Provides Quantitative Performance Objectives (QPOs) for inclusion in Operations Maintenance Surveillance Manuals (OMS)
Independent Tailings Review Board (ITRB)

- Required for each TSF (unless meets exemption criteria)
- Composition based on complexity of the facility (i.e. size, disciplines)
- Terms of reference (TOR) and board members required to be submitted to the Chief Inspector of Mines (CIM) for approval
- Report of ITRB activities required annually
LEGISLATIVE AND REGULATORY CHANGES

SUPERVISION/OVERSIGHT

TSF Qualified Person

- A designated, knowledgeable on-site person required for TSFs
- Coordinates the design, construction and day-to-day management of tailings storage facilities with all personnel
- Implements the OMS and reports on the status and performance of the Tailings Management System (TMS)
LEGISLATIVE AND REGULATORY CHANGES

CORPORATE GOVERNANCE/COMMITMENTS

Best Available Technologies (BAT)

- Permit applications must include an alternatives assessment of Best Available Technologies for tailings storage

Tailings Management System (TMS)

- Includes regular system audits
- Example of a TMS is Mining Association of Canada (MAC)’s Towards Sustainable Mining (TSM) – very comprehensive set of guidance and protocols.
Quantitative Performance Objectives (QPOs)

- Performance measurements (e.g. beach width, impoundment filling schedule, construction material availability, freeboard, instrumentation trigger levels etc.)

- Should be implemented in conjunction with Trigger Action Response Plans (TARPs) and included in the OMS

- Determined and reviewed by the EOR and TSF Qualified Person
LEGISLATIVE AND REGULATORY CHANGES

DESIGN AND FACTOR OF SAFETY (FOS)

- The EOR shall justify downstream slopes steeper than 2H:1V and receive authorization from the Chief Inspector of Mines (CIM)
- The EOR shall justify a calculated static FOS less than 1.5 and receive authorization from the Chief Inspector of Mines (CIM)
- Minimum flood and seismic design criteria are more conservative than previous criteria (that followed CDA Dam Safety Guidelines)
LEGISLATIVE AND REGULATORY CHANGES

REPORTING REQUIREMENTS

- Annual Reporting
  - Summary of TSF and dam safety recommendations, including a scheduled completion date
  - Updates to the TSF and dam register

- Water balance and water management plans

- OMS Manuals

- TSF Risk Assessment
LEGISLATIVE AND REGULATORY CHANGES

REPORTING REQUIREMENTS

- Dam Safety Reviews (DSRs)
  → Required every 5 years for all dams regardless of consequence classification

- Duty to Report Safety Issues at TSFs
  → The EOR shall immediately notify the Mine Manager in writing of any unresolved safety issue that compromises the integrity of the TSF
ORGANIZATIONAL CHANGES
REGULATORY EXCELLENCE:

• Restructuring to ensure clear separation of authorization and compliance functions (2 Mining Divisions)

  ➢ Properly resourced authorizations process
  ➢ Independent Effectiveness Audits function
  ➢ Policy and Industry Competitiveness
  ➢ Code Review Branch
  ➢ Abandoned Mines Branch
  ➢ Mines Investigation Unit
  ➢ Indigenous Engagement
  ➢ Increased transparency of oversight
ENGAGEMENT AND TRANSPARENCY
ACCESS TO INFORMATION

BC Mine Information Website
http://mines.nrs.gov.bc.ca/

Health, Safety and Reclamation Code
http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety

Mining Compliance and Enforcement
http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/compliance-enforcement
SUMMARY

- Issued technical directives to improve understanding of TSFs
- Initiated External and Internal investigations
- Revised Mines Act/Code:
  - Stronger compliance and enforcement actions
  - Multiple layers of TSF oversight
  - Corporate governance/commitments
  - Improvements to reporting requirements
  - Stronger design criteria
- Reviewed organization for regulatory excellence:
  - Independent effectiveness audits function
  - Practices and regulations in other jurisdictions
  - Improved organizational structure (New units)
- Proactive engagement and transparency
REFERENCES

INTERNAL

BC Mine Information Website
http://mines.nrs.gov.bc.ca/

Health, Safety and Reclamation Code
http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety

Health, Safety and Reclamation Code Guidance Document

Mining Compliance and Enforcement
http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/compliance-enforcement

EXTERNAL

Canadian Dam Association
https://www.cda.ca/

Mining Association of Canada
https://mining.ca/