Protecting a Gold Mine from Wildfire

“Lessons Learned”

Wildland Fire Canada 2010

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Presentation Overview

- Provincial Fire Situation
- Team Responsibility
- Mine Situation
- Team Response
- Environmental Protection
- Assessment
- Concluding Remarks
Fire Situation Overview

- 9 fire complexes Provincially
- Nationally everyone else busy
- Muskose complex – 5th in provincial priority
- Limited resources
  - Helicopters
  - Burn teams
  - Air tankers
  - Personnel
Team Responsibility

- Four fires by Deschambault Lake
  - Active suppression
- Protection of Mine Site
Mine Situation Overview

- Partial evacuation in place – 4 fires threatening mine site
- Losing $149,000 per day
  - Transportation
  - Food and lodging
  - Wages
  - Lost production
- Pressure to change policy
Economic Value

Infrastructure $200 million (relatively small)
Team Response

Assessment of situation
- Met with mine management
- Flew fires/values with them
- Listened to concerns
- Continued good communications

Assigned Expert Assistance
- Wildland Urban Interface Specialist
- Experienced Suppression Manager
Position Responsibilities

WUI Specialist
- Alert us to the hazardous goods & issues
- Reviewed and organized evacuation plan
- Sprinkler system management

Suppression Advisor
- Fuels management
- Suppression plan
- Supervise 20 type III staff
E P Assessment

- 5 Km evacuation zone
- 10 Km exclusion zone
- Up to 5 Km nothing living
- Years of clean up required
Air Dispersion Model

Based on chemicals present
Four models run
Three threat zones
  – Life threatening
  – Severe health risks
  – Mild discomfort
EP Assessment Concerns

- SCBA’s only good for 60 minutes
  - No fly zone: 5 km radius, 3000’
  - Have to walk into site to assess
  - Require 1/3 reservoir
  - Logistically impossible to manage

- Evacuate underground (Emergency Plan)
  - 3 days supplies
  - Recommended a full week
Dangerous Goods on Site

400,000 Kg sodium cyanide
20,000 Kg hydrochloric acid
2.5 million liters of diesel
Handout for complete list

Gold mines have especially bad chemicals

Potential to be a “World Class” Catastrophe
MINE SAFETY UNIT

THIS MAGAZINE OPERATED BY CLAUDE RESOURCES INC.
FOR THE STORAGE OF 150,000 DETONATORS

SIGNED

CHIEF MINES INSPECTOR

THIS PERMIT SHALL BE POSTED AND MAINTAINED IN THE MAGAZINE

The following requirements will be complied with:

A person shall not,

a) commit a careless act with an explosive or where explosives are stored;
   or
   b) omit or neglect to report immediately to the employer at the mine, the
      discovery of any such act having been committed.

The employer shall,

a) make a prompt investigation when an act is discovered by or reported to
   that employer;
   b) report each such act to an inspector within twenty-four hours.

Every magazine shall be under the direction of the employer or a person
appointed by the employer.

Every magazine shall be securely locked at all times when the attendant is not
present and it shall be clearly indicated by some visible sign that explosives,
blasting agents or detonators are stored therein.

Every possible precaution shall be taken in the handling and transportation of
explosives, blasting agents and detonators. Care shall always be exercised to
avoid physical shock. Rough handling shall not be permitted. Cases containing
explosives shall always be lifted and set down carefully and never dropped.

A worker shall not smoke while handling, transporting or using explosives,
blasting agents or detonators or within twenty-five feet of any magazine or
other place in which they are stored or handled.

An explosive shall not be used at a mine unless there is plainly printed or
marked on every original package containing such explosive,

a) the name and place of business of the manufacturer;
   b) the strength of the explosive;
   c) the date of its manufacture.

An article of iron or steel, other than a fixture, shall not be kept or used in
any magazine.

An open flame shall not be taken within twenty-five feet of any magazine in
which explosives, blasting agents or detonators are stored.

No detonator or capped fuse shall be,

a) kept or stored with other explosives; or
   b) taken into a magazine or other place where other explosives are kept.

Detonating fuse shall be stored in the explosives magazine and not in the same
storage place as any detonator or capped fuse.

Every magazine at a mine shall be kept meticulously clean, dry and free from
grit and other extraneous material at all times.

Broken cartridges of explosive, spalled blasting agent or deteriorated blasting
caps shall not be allowed to accumulate in a magazine but shall be cleaned up
and suitably disposed of.

The shelves and floors of every magazine shall be treated, when necessary,
with caustic lime or other suitable neutralizing agent to remove any traces of
explosive substances.

For every magazine for which a licence has been issued there shall be main-
tained an accurate record of,

a) the total quantity of explosive, blasting agent and the number of
detonators;
   b) the date, quantity, type of any delivery of explosive, blasting agent or
detonators to that magazine;
   c) the date, quantity, type and name of person to whom any explosive,
      blasting agent or detonator was issued;
   d) the signature of the persons responsible for accepting or issuing such
      explosive, blasting agent or detonators;
   e) the record shall be countersigned by the person required to make the
      inspection.
Hazardous Substance Storage

- VERY POOR
  - Liquid chemicals uphill from solids
  - Stored on wooden pallets
  - Unstable ground/poor practices
  - Standing diesel in containment facilities
Debrief Recommendations

- Fire staff receive 1st Response Training
  - 12 hour NFPA 471 & 472
- E P Officer Liaison position
- MOU’s be developed with private Hazmat companies (major cities)
- Hazardous Sites identified on our Values at Risk website
- Fire staff access to industry emergency & Pre-incident plans
Hazardous Goods Management

- Do not add water – prior to or after it catches on fire
  - Oxidizes – toxic fume
  - Incomplete burn is worse
  - Toxic sludge and runoff
- Let burn – hotter the better
- Evacuate
End Results - Mine

- Mine received significant amount of “Free” consultation work
- Mine forced to bring in consultants at their expense
  - Chemical storage
  - Emergency and Incident Preplanning
- Interested in receiving some WUI training
Conclusion

- Fires did not reach mine site
- Good lessons learned
- Built positive relations with mine staff and EP staff
- Plan to have a follow up debrief just on the mine incident
Questions?