



# **A PLAN FOR THE MINING INDUSTRY**

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## RIGHT NOW → TRENDS

- New mines difficult to develop / permit
  - 1 in 5000 deposits become a mine
  - Extend life of old mines → mined grades are lower and lower
  
- Mining is moving north
  - If polar ice melts, expect more interest in northern minerals
  - New engineering principles will have to be developed



# PLAN FOR THE FUTURE

## ➤ Research

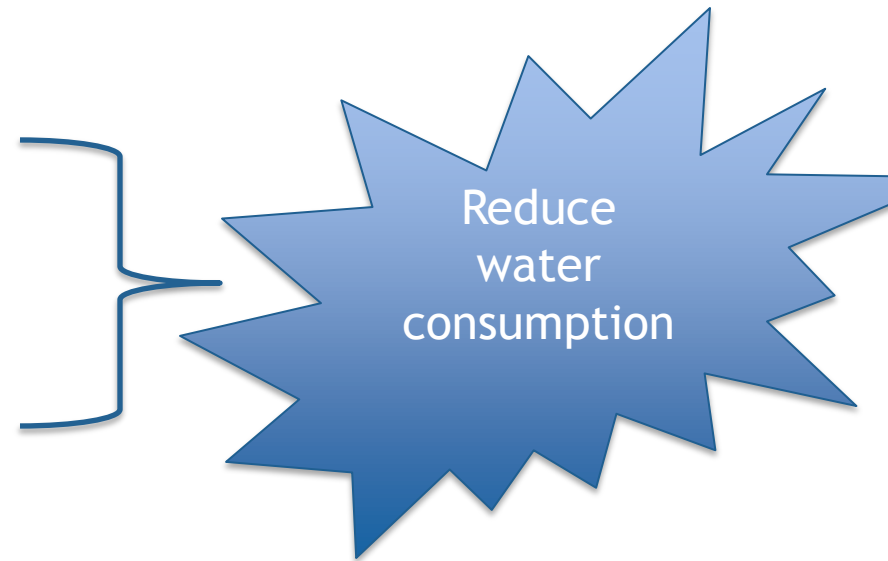
- New engineering knowledge is needed for cold climate mining to be economical
- Like retirement planning, it takes less money if you plan ahead

## ➤ Processes that govern / impact mining

- Permits
  - Permits will get more complex as mines have to meet complex standards
  - Will overwhelm permitting agencies
- Public Opinion

# PLAN: RESEARCH

- Modern mining
  - Water
    - Very little
    - Cannot discharge
    - Too much





# PLAN: RESEARCH

- Improve minerals recoveries
  - How low can we go?
    - Begging for more oil in Alaska. This will happen in mining too
  - Cold climate impacts
    - Process plants
    - Leach
  - Your only shot - make it count



## PLAN: RESEARCH

- Lower environmental impact
  - Benign chemicals
- Deal with environmental impact
  - Mitigate fish habitats
  - Tailings processing / storage





## PLAN: RESEARCH

- Mineral processing is key
  - Water related, improving recovery, benign chemicals, environmental impacts
  - Expertise is in short supply



# PLAN: PROCESS

- Use your university: Permitting & scientific studies
  - Unused resource
  - Faculty are available 3 months/year
- Improve the 1:5000 odds
  - Add basic mineral processing studies to state exploration programs
  - Will kill a few deposits, and identify easy ones
  - Private sector will focus only on “easy” deposits





## PLAN: PROCESS

- Inter-state research partnership
  - No one is good at everything
    - Canadians/BC ahead on fish habitat mitigation
    - Alaska has substantial cold climate mining engineering knowledge



# SUMMARY

- Investment in mineral processing knowledge is essential
- States must look at their universities as a resource



# QUESTIONS

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