



Indigenous and
Northern Affairs Canada

Affaires autochtones
et du Nord Canada

Giant Mine
Remediation Project

Giant Mine Remediation Project

The Long Road to Reclamation
Atlantic Reclamation Conference
October 2016

Presentation Objectives



- Provide an overview and history of the Giant Mine Site
- Overview of the GMRP
- Describe the “Long Road” and current project status
- Outline the Remedial Options on the table
- Identify next steps in moving forward





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Introduction & History

Site Location

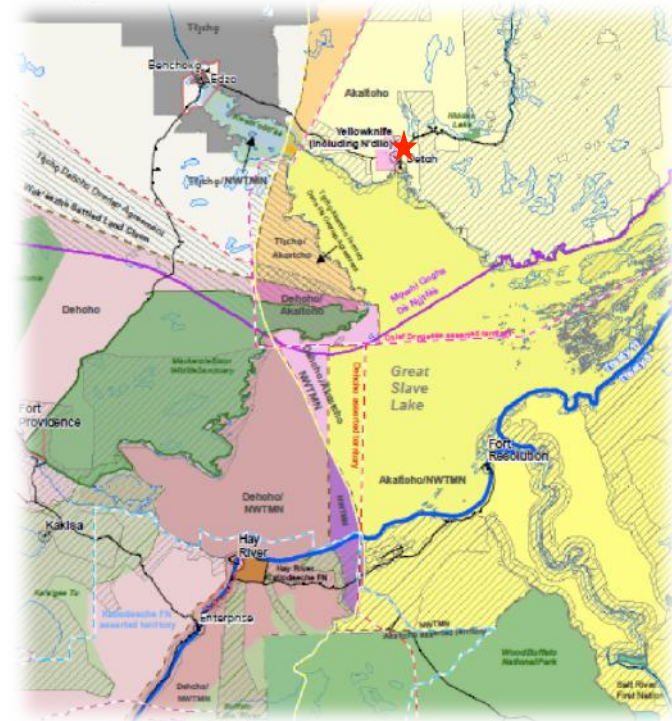
- Site is approximately 900 hectares in size
- Larger than several small towns in Nova Scotia
- Located 5 km from urban centre of the City of Yellowknife, Northwest Territories



Jurisdiction



- Lies on Commissioners Land, jurisdiction of the Government of the Northwest Territories
- Site under Federal care as an abandoned mine site
- Municipal involvement
- Several overlapping established and asserted Indigenous land claims



Site Features

Highway 4 (Ingraham Trail)

Baker Creek

B-2 Pit

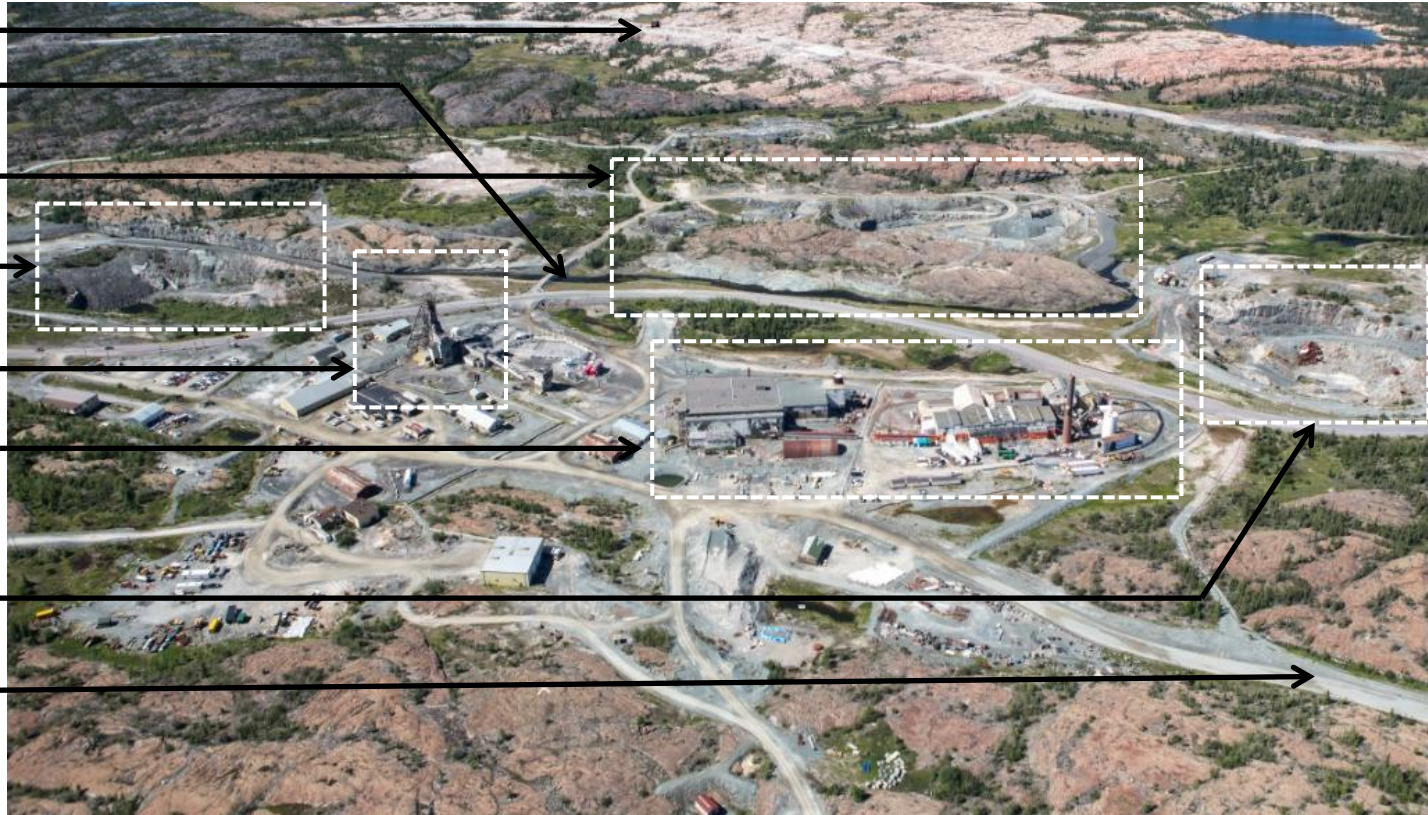
C-1 Pit

C-Shaft Headframe

Former Roaster Complex

B-1 Pit

To tailings ponds &
water treatment plant



Giant Mine Site 101

- One of Canada's longest operating gold mines
- Produced its 10,000th brick in 1984
- Generated 7 million ounces of gold during its operation

Former gold mine, started operation in 1944

Lies within city limits and overlapping Aboriginal land claims

Operated continuously until 1999

Roasting of ore produced Arsenic Trioxide dust, a toxic contaminant



Canada's Role

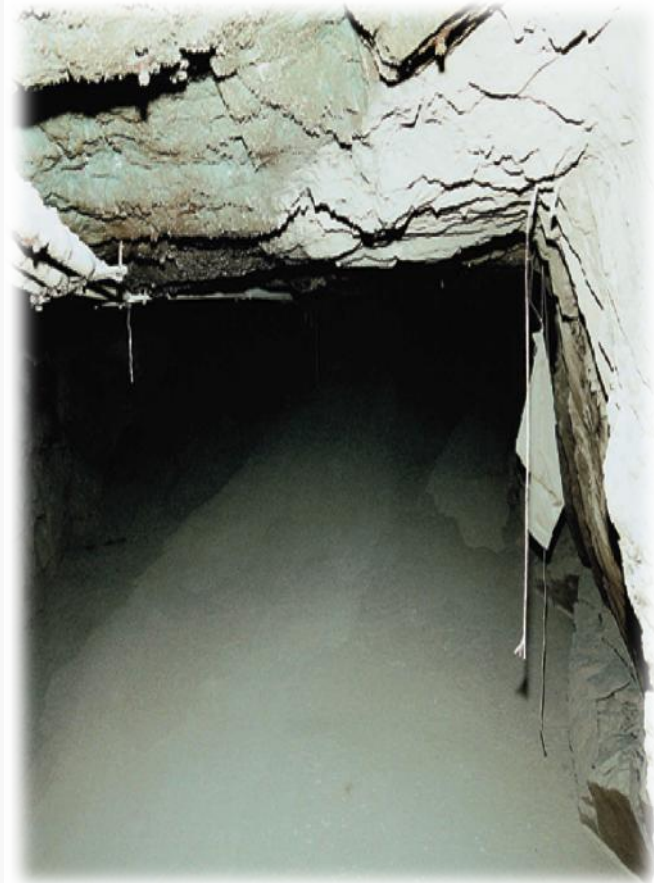
- Indigenous and Northern Affairs Canada is responsible for the management of Crown lands in the north (*Department of Indian Affairs and Northern Development Act*)
- INAC was assigned responsibility to deal with the environmental legacy at the site, through closure and reclamation of the Giant Mine
- For Giant, INAC is both the proponent and the regulator, since the Minister of INAC is also the Responsible Minister under the *Mackenzie Valley Resource Management Act*
- The Giant Mine Remediation Project was created, with the Government of the Northwest Territories a co-proponent in the regulatory approvals process



Arsenic Trioxide



- Arsenic trioxide dust created during roasting process (as a result of minimizing arsenic emissions in air discharge)
- 237,000 tonnes of arsenic trioxide dust generated during mine operation
- A dry powder, the consistency of fine flour
- On average contains 60% arsenic trioxide
- Highly toxic and dissolves in water





- Dust was pumped pneumatically into the underground
- Used 3 mined out stopes (irregular shapes)
- Also 11 purpose-built chambers (rectangular shapes), one of which is empty
- 30 – 100 m below surface



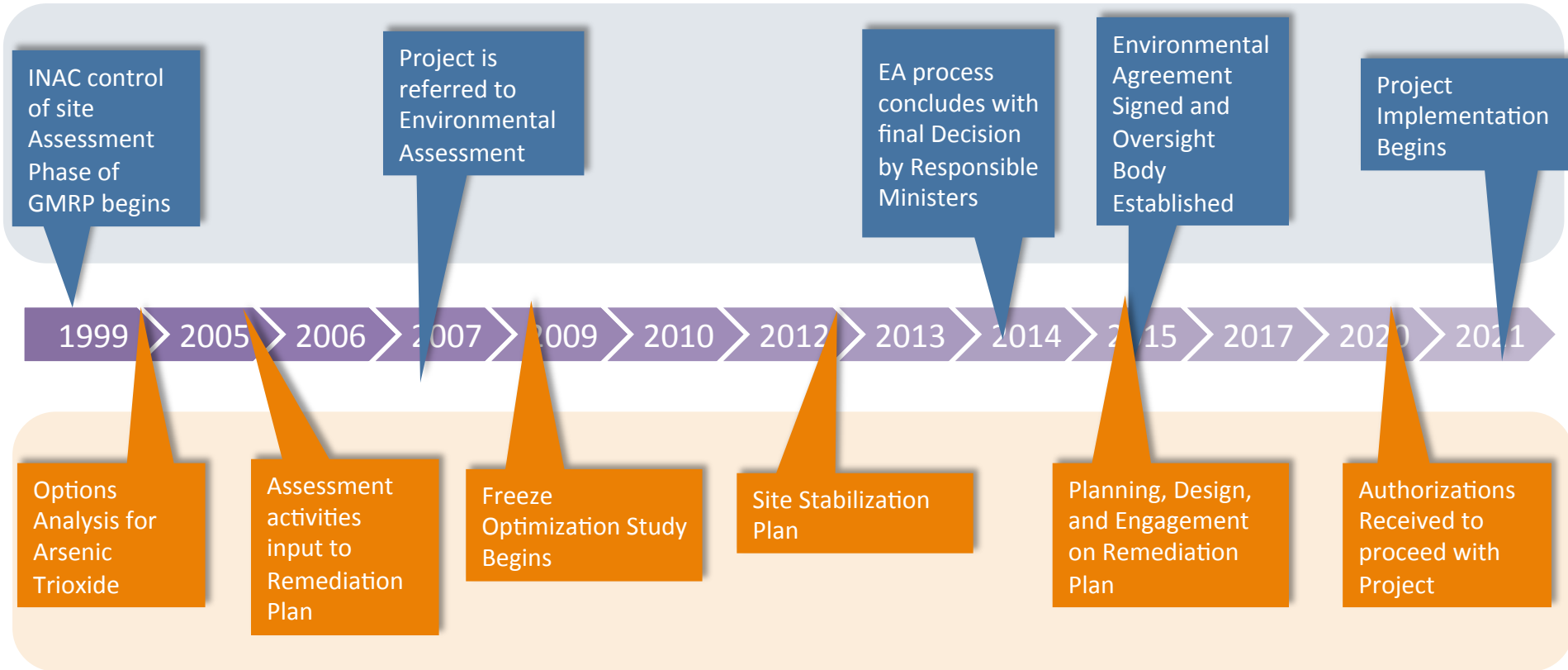
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The Long Road

Project Timeline



Environmental Assessment

Timeline to a Decision:

2009: Mackenzie Valley Environmental Review Board releases Terms of Reference for Environmental Assessment

2010: A series of public meetings were held to discuss the components of the Remediation Plan and their possible impacts on the environment; Project Team submits Developer's Assessment Report to Review Board

2011: First Round of Information Requests were completed as part of Environmental Assessment; Review Board holds technical sessions as part of Environmental Assessment

2012: Second round of Information Requests completed as part of Environmental Assessment; Review Board holds public hearings as part of Environmental Assessment; Review Board public registry closes

2013: Report of Environmental Assessment issued by Review Board, with 26 proposed Measures

2014: Responsible Ministers approval Final Report of Environmental Assessment, accepting all 26 Measures, 9 with modifications

Moving Forward



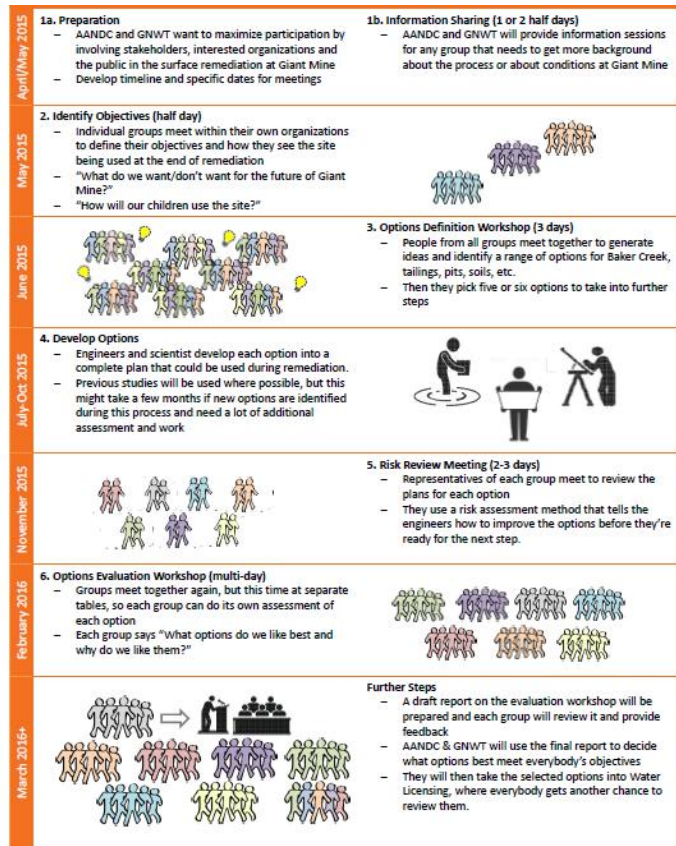
- Environmental Assessment Measures have a significant impact on the project scope
- Freeze program will not change much
- Engagement and planning requirements for surface features are current focus



Surface Design Engagement



- Give stakeholders the best possible opportunity to have input into remediation decisions
- Analyze a wide range of options
- Get feedback about those options from all stakeholders
- Give decision-makers an effective opportunity to understand the views and preferences of stakeholders
- Results will become inputs to decisions by the Project Team



Water Licensing

- Following completion of the Environmental Assessment, the Mackenzie Valley Land and Water Board requires a Post-EA Information Package
- An updated Closure and Reclamation Plan that informs the water licence
- Intent is to receive a water licence based on preliminary designs and management plans
- As individual management plans are finalized, they will be submitted for approval under the overall water licence





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Remedial Options



Project Components

Remediation & Reclamation Activities in Project Scope

- Infrastructure deconstruction and disposal
- Surface water management
- Tailings rehabilitation
- Borrow/Quarry development
- Underground stabilization
- Freeze Program
- Closing mine openings to surface
- Open pits
- Contaminated soil
- Baker Creek realignment
- New effluent treatment plant
- Optimize site infrastructure

Open Pits



- Eight open pits on site, with a total volume of 2.2 Million m³
- B1 Pit will be backfilled to support freeze solution
- Possible backfill materials will be contaminated soils, tailings, other on-site material
- Approach for other pits being evaluated following Report of Environmental Assessment



Tailings Management

- 95 hectares of tailings of variable depth and quality
- Tailings cap requirements will be informed by engagement process
- Graded to promote drainage of clean surface water
- Ongoing monitoring and maintenance of caps and dams will be required



Contaminated Soils



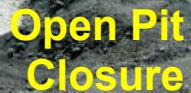
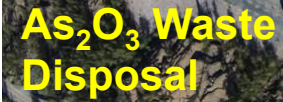
- Approximately 900,000 m³ of arsenic-impacted material in the form of waste rock and disturbed soils
- Minor amounts of petroleum hydrocarbon-contaminated soil (primary diesel from storage tanks supplying generators)
- Remedial approach for soils will be based on results of a Human and Health and Ecological Risk Assessment



Baker Creek



- Current channel has poor hydraulic capacity; high seasonal flow variability
- Provides fish habitat
- Historic tailings and contaminated sediments
- Potential risk of flooding underground workings
- Realignment being reviewed after Report of Environmental Assessment



Interdependencies



Next Steps to Remediation



- Project Approval Authority for rest of Design Phase (2017)
- Project Approval Authority for Implementation Phase (2018)
- Finalize Closure and Reclamation Plan (2019)
- Approved Water License (2020)
- Commence Final Remediation (2021)



In Retrospect

- Giant produced 7 million ounces of gold during its operation
- Contributed to economic prosperity in Yellowknife and Canada
- Had mixed social consequences on different groups, such as Indigenous people
- Left behind a massive environmental and human health legacy
- Full price tag to clean up is not yet known, but will be several hundred million dollars





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Giant Mine Remediation Project – Questions??