Giant Mine Remediation Project

Northwest Territories

Canada

MCM Bidder's Site Tour

August 31, 2016

Yellowknife

Giant Project Roles and Responsibilities

In 1999, Royal Oaks Mines went into receivership and the care and control of the mine site was transferred to INAC and the Government of the Northwest Territories. INAC maintained this responsibility following the passage of the **Northwest Territories Devolution Act**.

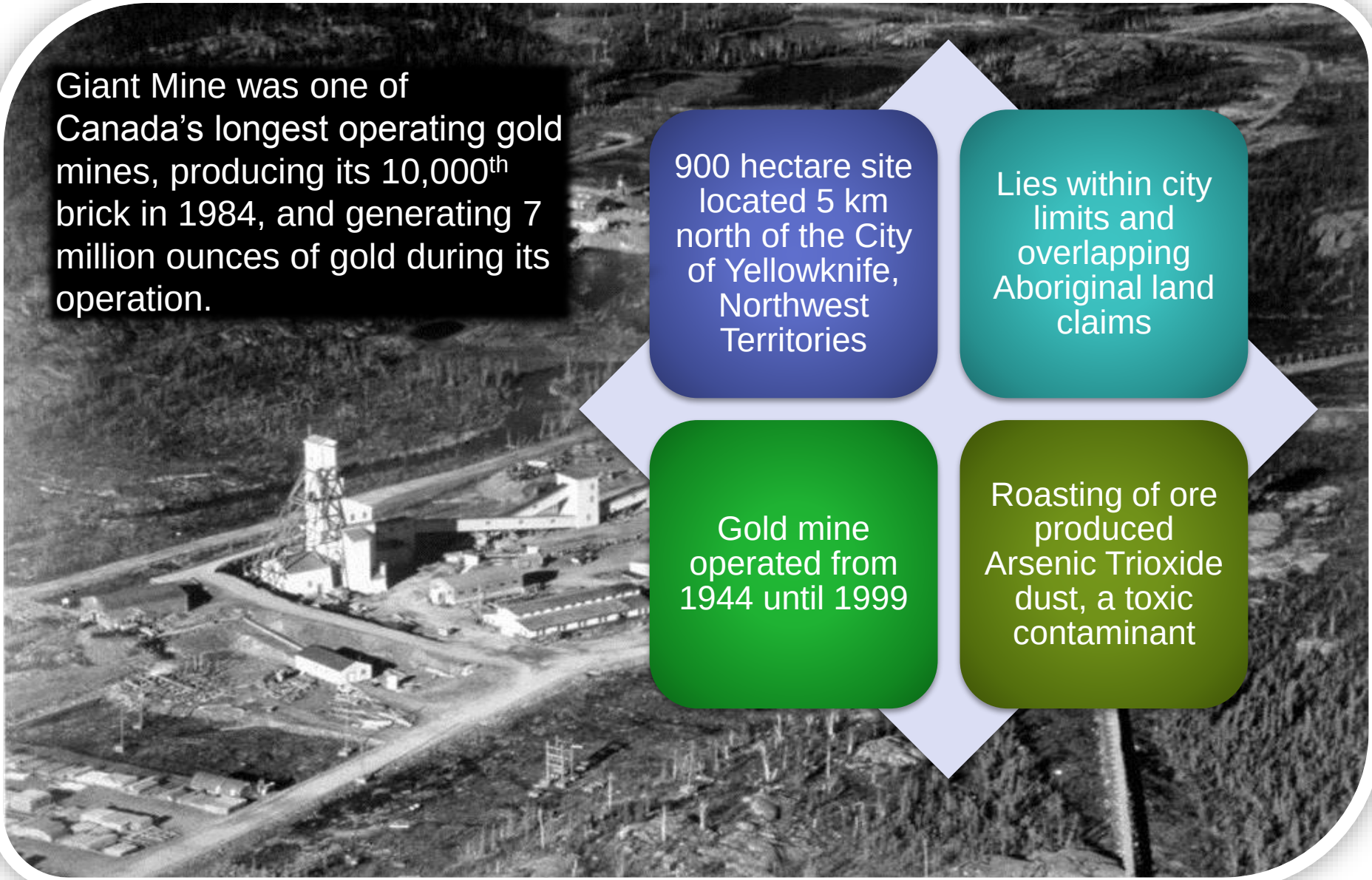
INAC maintains liability and responsibility for funding and completing the remediation of the Giant Mine

Public Work and Government Services Canada provides contracting, contract management and project management support to INAC.

Government of Northwest Territories and the Government of Canada are co-proponents in delivery of the Giant Mine project.

1999 Giant Closed | 2004 | 2007 | 2008 | 2011 | 2012 | 2013 | 2014 | 2015

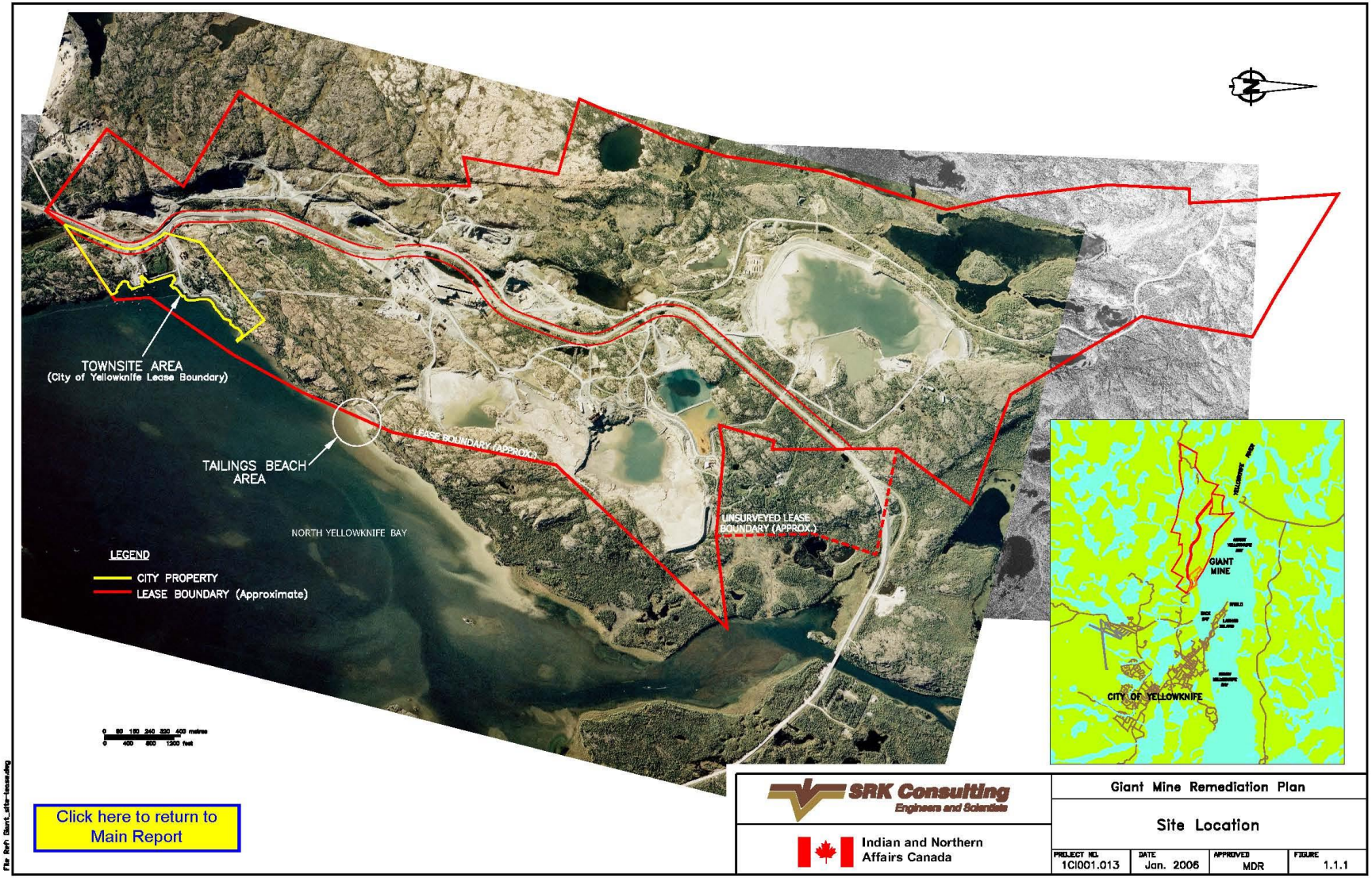
Giant Mine Site History



Giant Mine was one of Canada's longest operating gold mines, producing its 10,000th brick in 1984, and generating 7 million ounces of gold during its operation.

- 900 hectare site located 5 km north of the City of Yellowknife, Northwest Territories
- Lies within city limits and overlapping Aboriginal land claims
- Gold mine operated from 1944 until 1999
- Roasting of ore produced Arsenic Trioxide dust, a toxic contaminant

Giant Mine Site Overview



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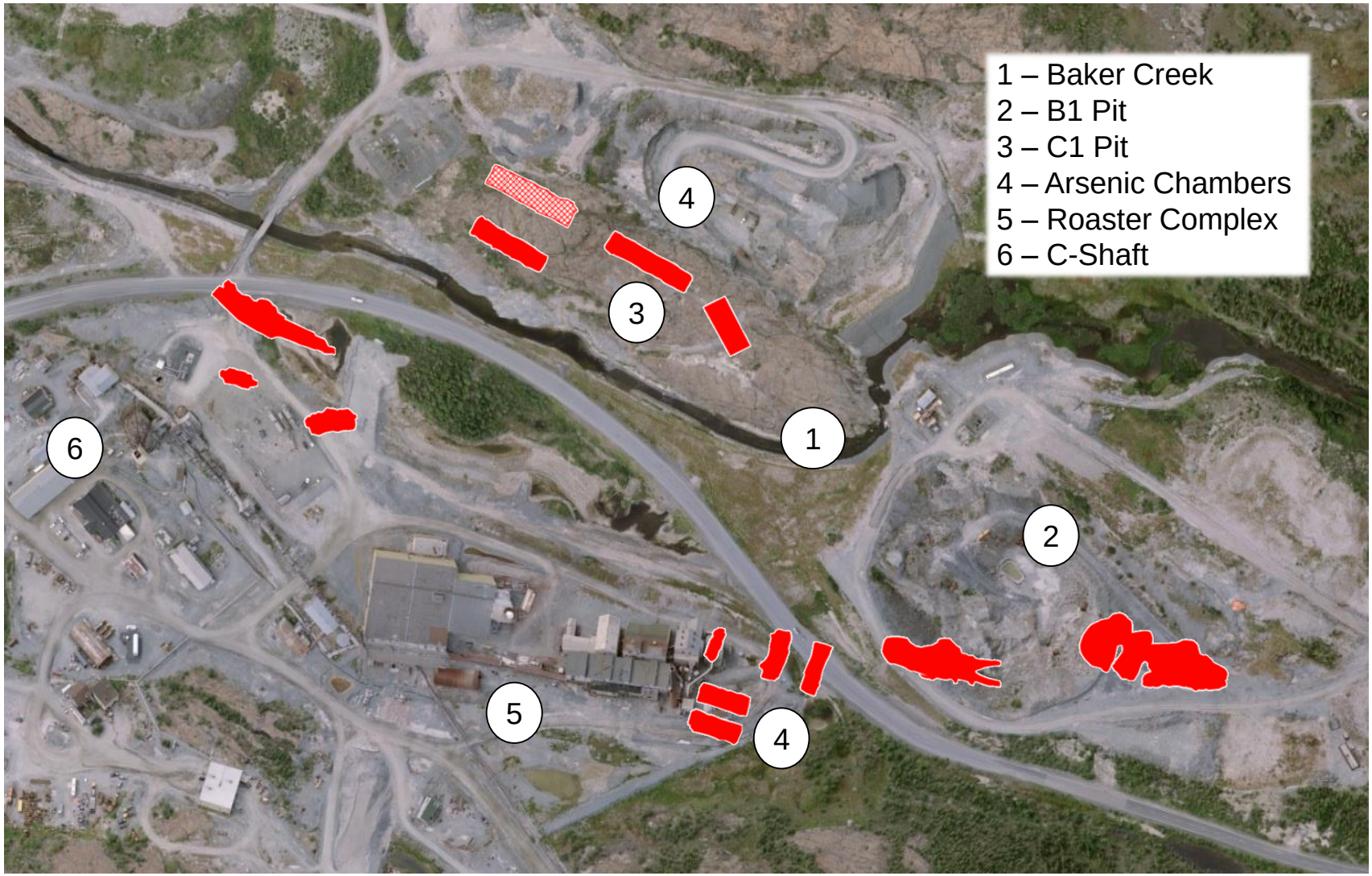
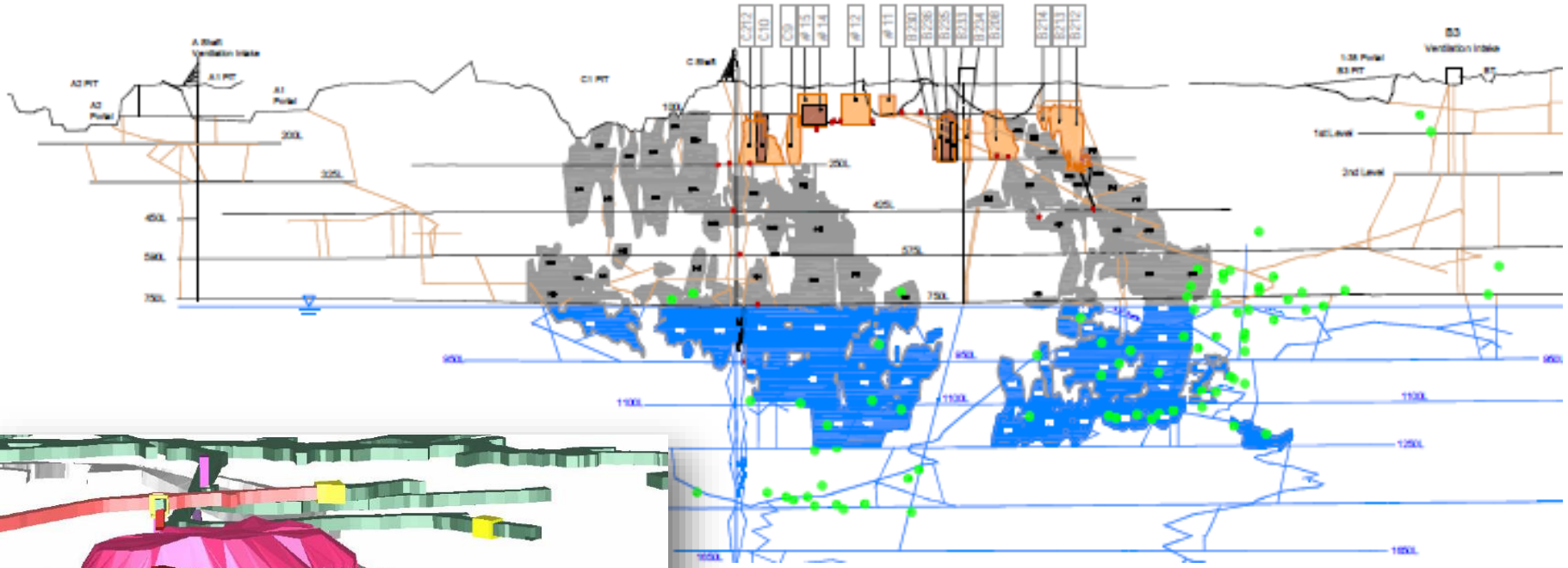
Giant Mine Site Overview



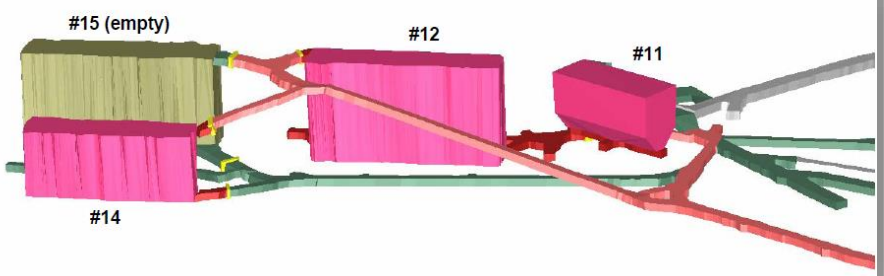
Giant Mine Site Overview

Mine Cross Section



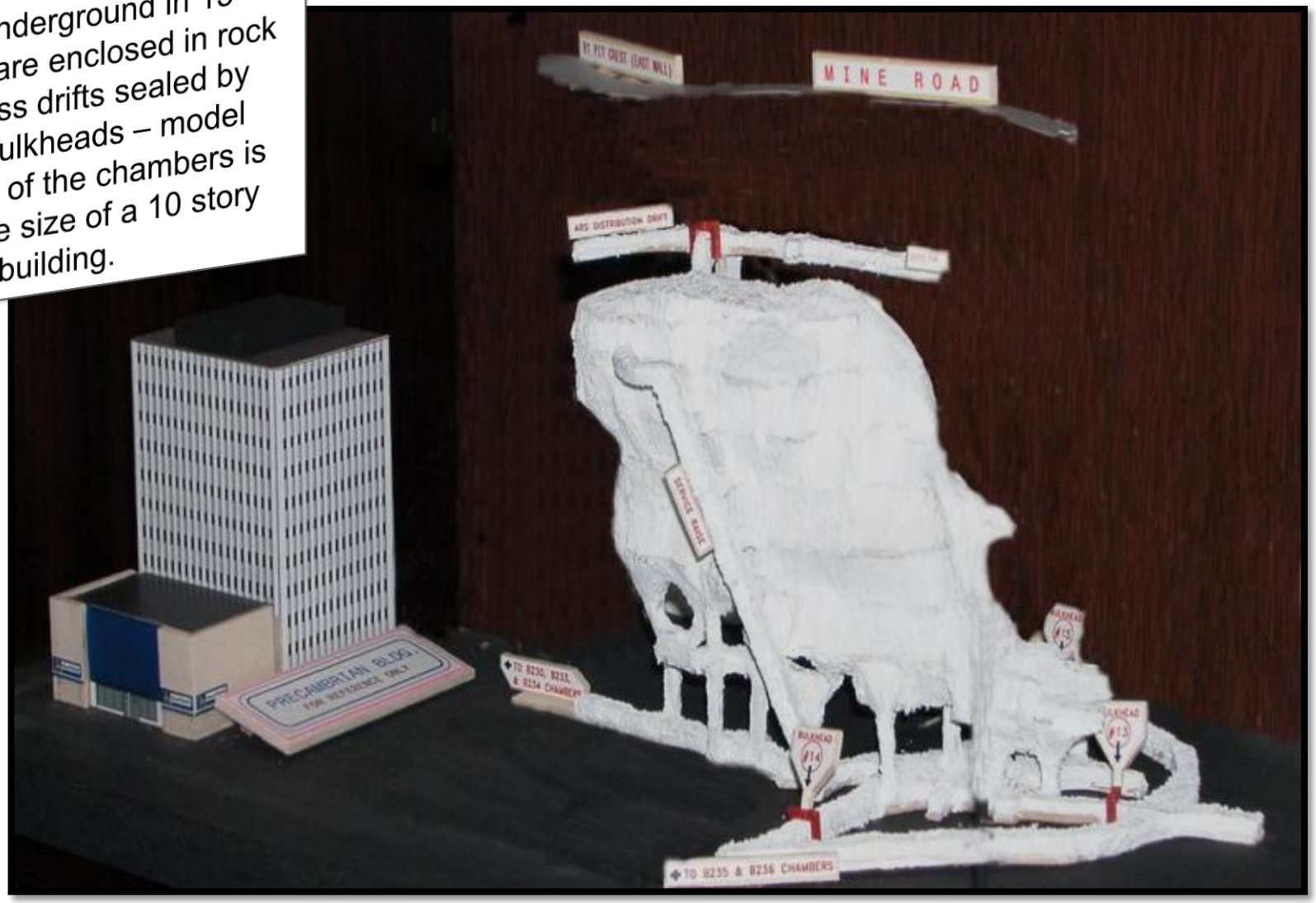
Arsenic Stope

Arsenic Chamber



Giant Mine Site Overview

Arsenic trioxide dust, currently stored underground in 15 chambers, are enclosed in rock with access drifts sealed by cement bulkheads – model shows one of the chambers is roughly the size of a 10 story building.



Remediation Project Objectives

In 2001, INAC working with several other experts and groups explored options for the arsenic trioxide dust and other issues, and set the following objectives for the Giant Mine Remediation Project:

- Minimize public and worker health and safety risks
- Implement an approach that is cost effective and robust over the long-term
- Minimize the release of contaminants from the site to the surrounding environment
- Remediate the site in a manner that instills public confidence

1999 Giant Closed | 2001 Remedial Options | 2007 | 2008 | 2011 | 2012 | 2013 | 2014 | 2015

Giant Mine Remediation Plan

In 2007 INAC submitted a Remediation plan to seek authorization under the Mackenzie Valley Resource Management Act:

Management of Arsenic Trioxide

- Frozen Block Method
- Ongoing Water Treatment

Pits

- Stabilize Open Pit Walls
- Restrict access to pits

Tailings and Waste Rock

- Regrade and Cap Tailings
- Regrade, Cap, or move Waste Rock underground

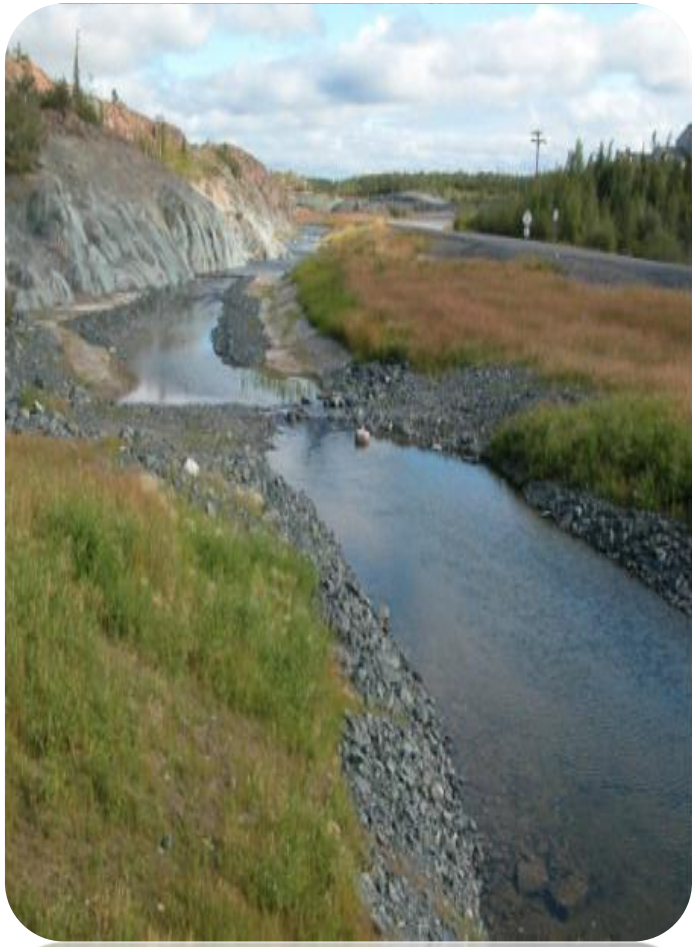
Other

- Demolition of Infrastructure
- Management of Contaminated Soil

1999 | 2004 | 2007 Plan | 2008 | 2011 | 2012 | 2013 | 2014 | 2015

Environmental Assessment

- In 2008, the Project was referred to Environmental Assessment by the City of Yellowknife.
- Resulted in the Report of Environmental Assessment in 2013, with 26 proposed Measures
- Ministers of INAC, Fisheries and Oceans, Environment Canada and Government of Northwest Territories agreed to Decision of Environmental Assessment and 26 legally-binding Measures (some with modifications) in August 2014



1999 | 2004 | 2007 | 2008 Assess | 2011 | 2012 | 2013 | 2014 Decision | 2015

Site Stabilization Plan

By 2012, site conditions were degrading to a point that INAC took action to mitigate the very high risks and applied for an emergency water licence to undertake immediate risk mitigation work through two main projects:

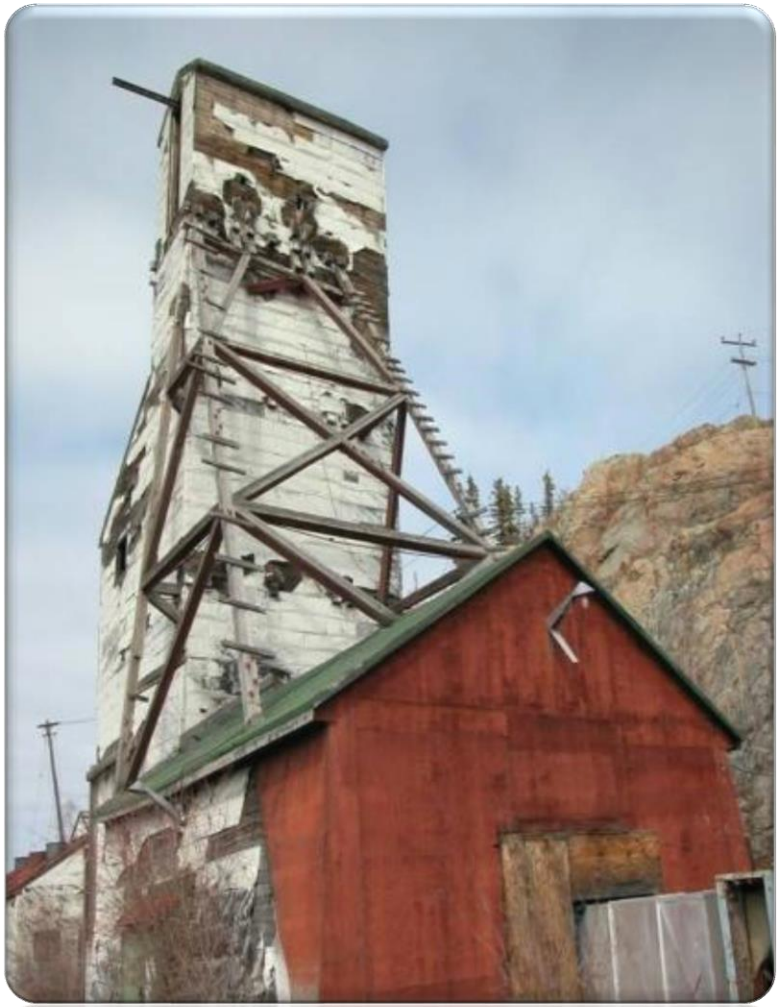
The Roaster Complex Deconstruction removed 10 highly contaminated and unsafe structures from the site, where the main processing of ore took place and the creation of the arsenic trioxide dust. Overall cost was $48 million to remove.

Underground Site Stabilization involves filling of chambers and voids to prevent collapse of subsurface structures and failure of the arsenic stopes and chambers, at a cost of $ 44 million to date.

1999 | 2004 | 2007 | 2010 | 2011 | 2012 - 2015 Action | 2015

Completed to Date

- Baker Creek Improvements to reduce flooding risk ($ 2 M)
- Securing Infrastructure, reducing potential for public access ($ 200 K)
- Mill Conveyor Removal ($ 400 K)
- Freeze Optimization Study ($ 26 M)
- Roaster Complex Demolition ($43 M)
- Underground Stabilization ($ 21 M)
- C1 Pit Wall stabilization ($ 2 M)
- C-Shaft headframe deconstruction ($ 2 M)
- A-Shaft headframe, Assay Lab, Curling Rink deconstruction ($ 2 M)
- Finalizing Environmental Agreement & Establishing Independent Oversight Body as required by the Environmental Assessment



1999 2004 2007 2008 2011 2012 2013 2014 2015 2016

Site Remediation Schedule

Phase 1 Project Assessment	**Phase 2** Project Definition	**Phase 3** Project Implementation	**Phase 4** Monitoring and Maintenance
1998 – 2006	2006 – 2021	2021 – 2035	2035 and beyond
• Site Assessment • Care and Maintenance • Identify Remediation Approach	• Develop remediation plan • Environmental Assessment • Site Stabilization Plan • Care & Maintenance • Freeze Optimization Study • Regulatory Approvals	• Full-Site Remediation	• Post-Remediation Adaptation • Care and Maintenance • Water Treatment • Long-Term Monitoring

All funding provided by the Federal Contaminated Sites Action Plan

Remediation Components – Draft Scope

- Infrastructure Deconstruction and Disposal
- Surface Water Management
- Tailings Rehabilitation
- Openings to Surface
- Contaminated Soil
- Open Pits
- Borrow/Quarry Development
- Underground Stabilization
- Routing of Baker Creek
- New Effluent Treatment Plant
- Common Site Infrastructure
- Underground Freezing of Chambers and Stopes

Care & maintenance activities ongoing throughout

Questions?

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