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Affairs Canada

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Colomac Mine Remediation Project *“Nearing Completion”*

Northern Latitudes
Mining Reclamation
Workshop

Yellowknife - September 10, 2009

Presented by:

Ron Breadmore

Project Manager - Tlicho Region



Colomac Mine Remediation Project

Presentation Overview

- Colomac Site History & Description
- Remediation to Date
- Remaining Work
- Post closure



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Colomac Site Location

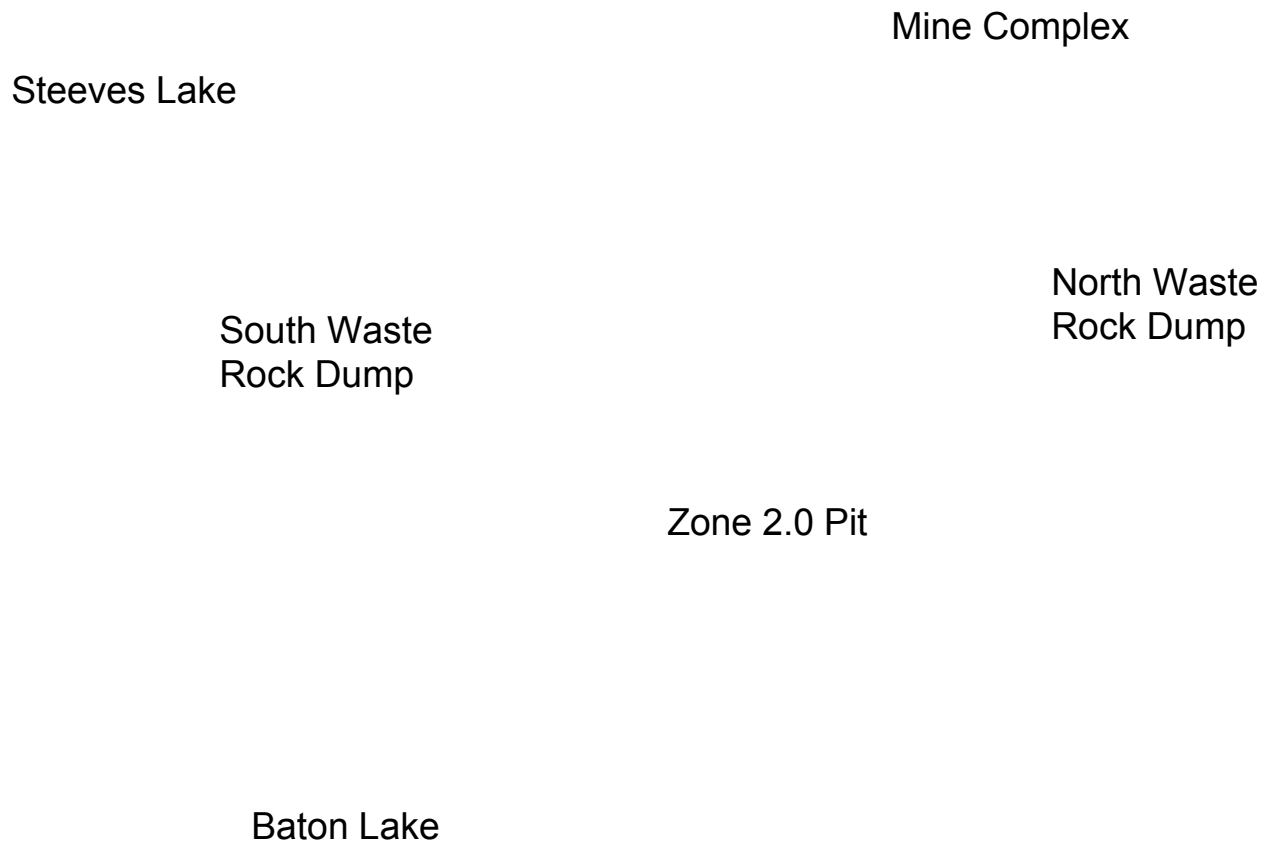


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Colomac Site Description

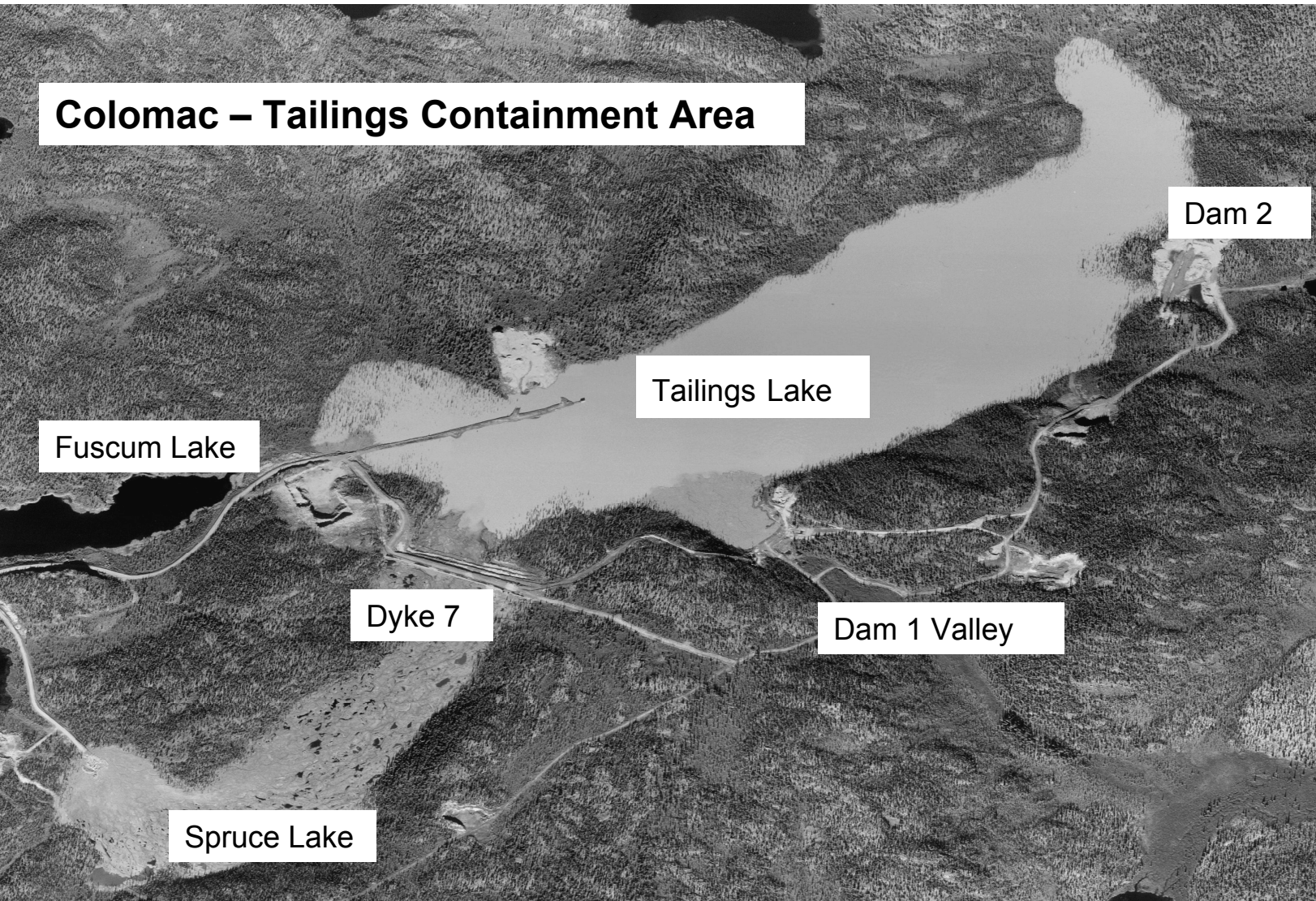
Colomac – south mine area



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Colomac Site Description



Colomac – Tailings Containment Area

Dam 2

Tailings Lake

Fuscum Lake

Dyke 7

Dam 1 Valley

Spruce Lake



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Colomac Mine History



- Open pit mine
- 10,000 TPD mill
- average grade 0.05 opt
- 535,000 troy oz recovered

- 35 M tonnes waste rock
- 11 M tonnes tailings



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Colomac at Abandonment

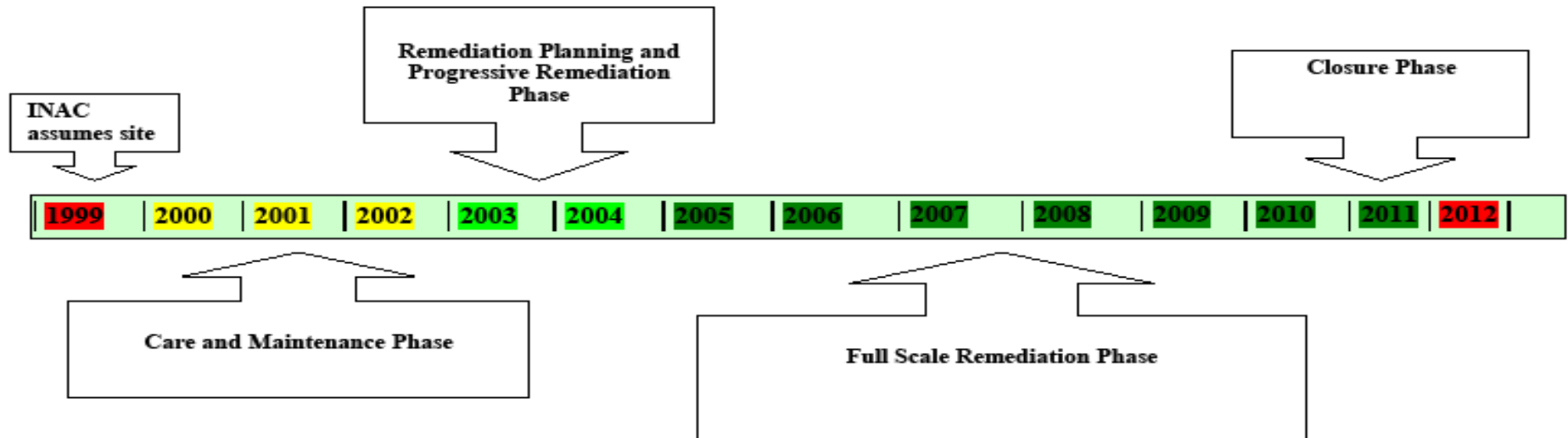


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Colomac Mine Remediation Project

Colomac Remediation Project History





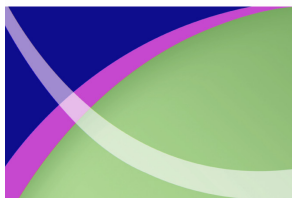
Colomac Mine Remediation Project

Care and Maintenance Phase

1999-2002



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Colomac Care & Maintenance Phase



- Dam 1 seepage collection
- **Water management**
- Camp and mine infrastructure maintenance



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Colomac Mine Remediation Project

Progressive Remediation and Remediation Planning Phase

2003-2005



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Colomac Progressive Remediation

Site Cleanup and Caribou Fence



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Colomac Progressive Remediation



Diversion Ditch Program



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Colomac Progressive Remediation



**Pilot water
treatment**

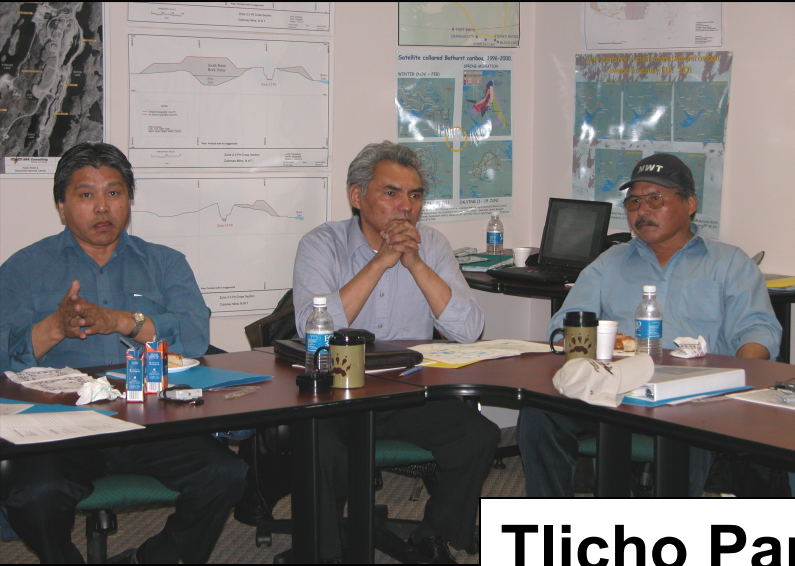


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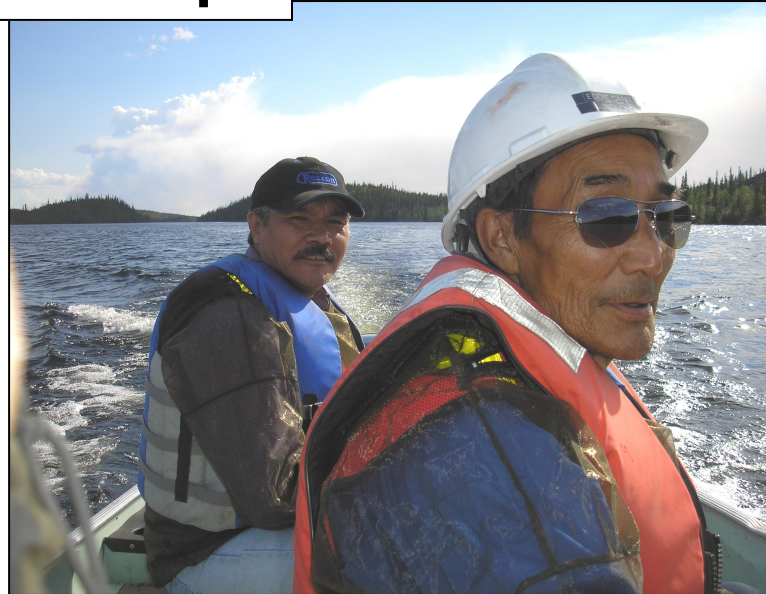
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Colomac Remediation Planning



Tlicho Partnership



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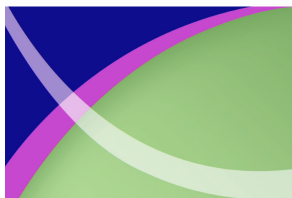


Colomac Mine Remediation Project

Remediation Challenges *and* Successes



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Colomac Mine Remediation Project

Water Management and Treatment



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Colomac Water Management



Emergency Water
Transfer from
Tailings Lake to
Z2.0Pit - 1999

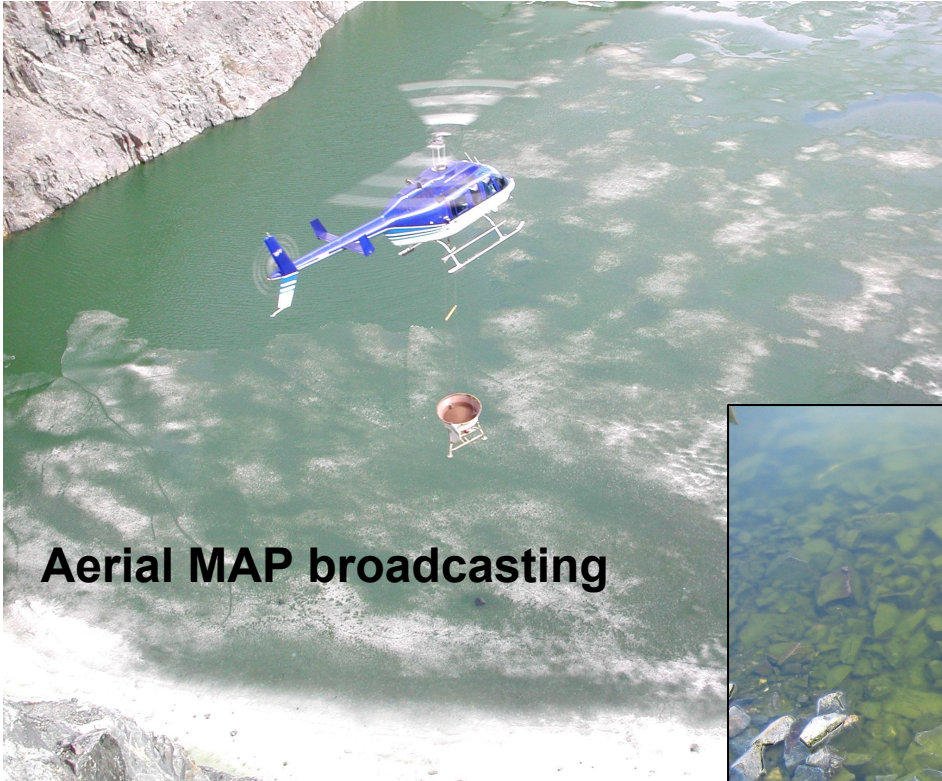


Additional transfers
2000 - 2002
Total = 3.4 M m³





Colomac Water Treatment (ENR)



Aerial MAP broadcasting

MAP addition

2002: 22 tonnes

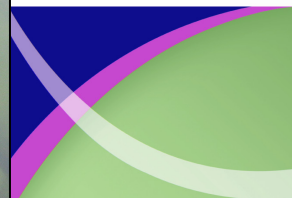
2003: 9 tonnes



Algal growth

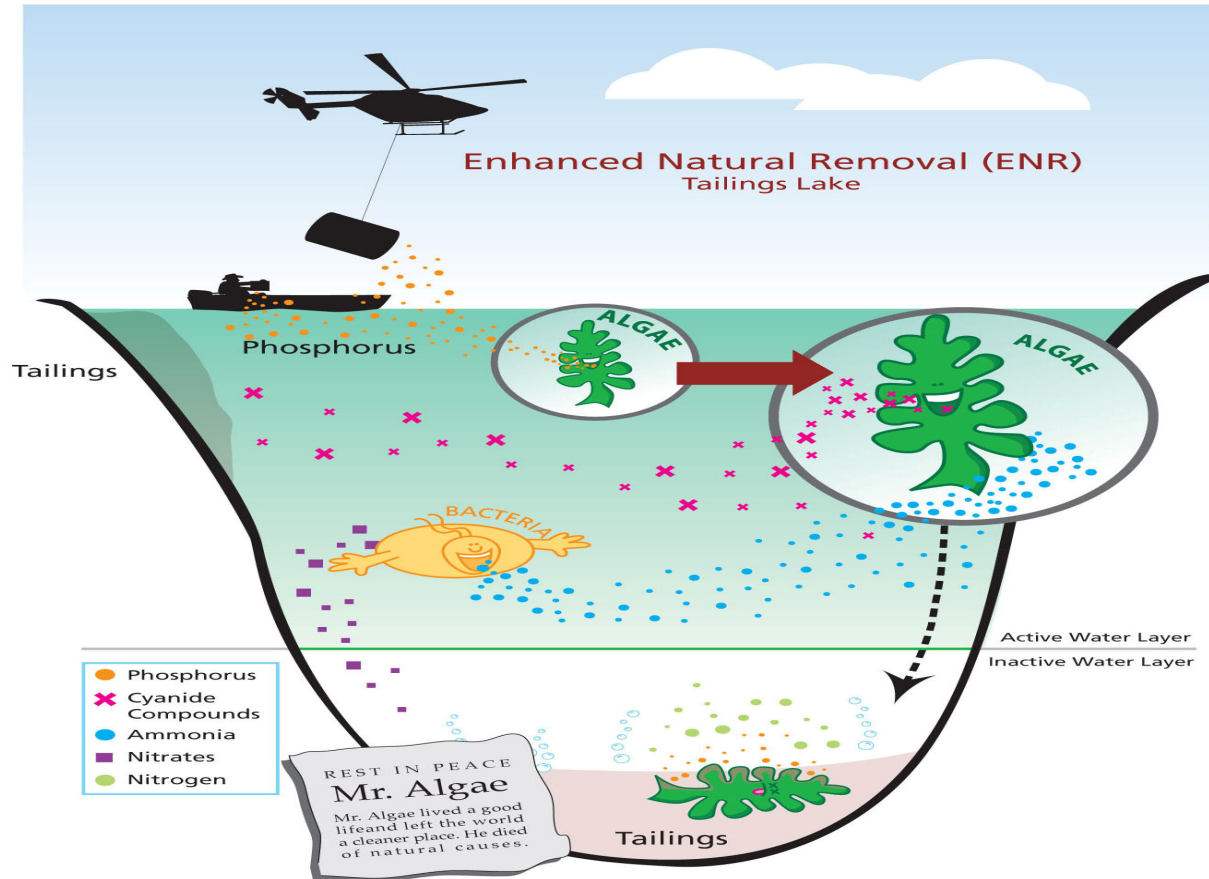


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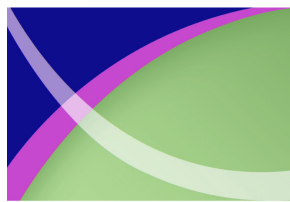




Colomac ENR

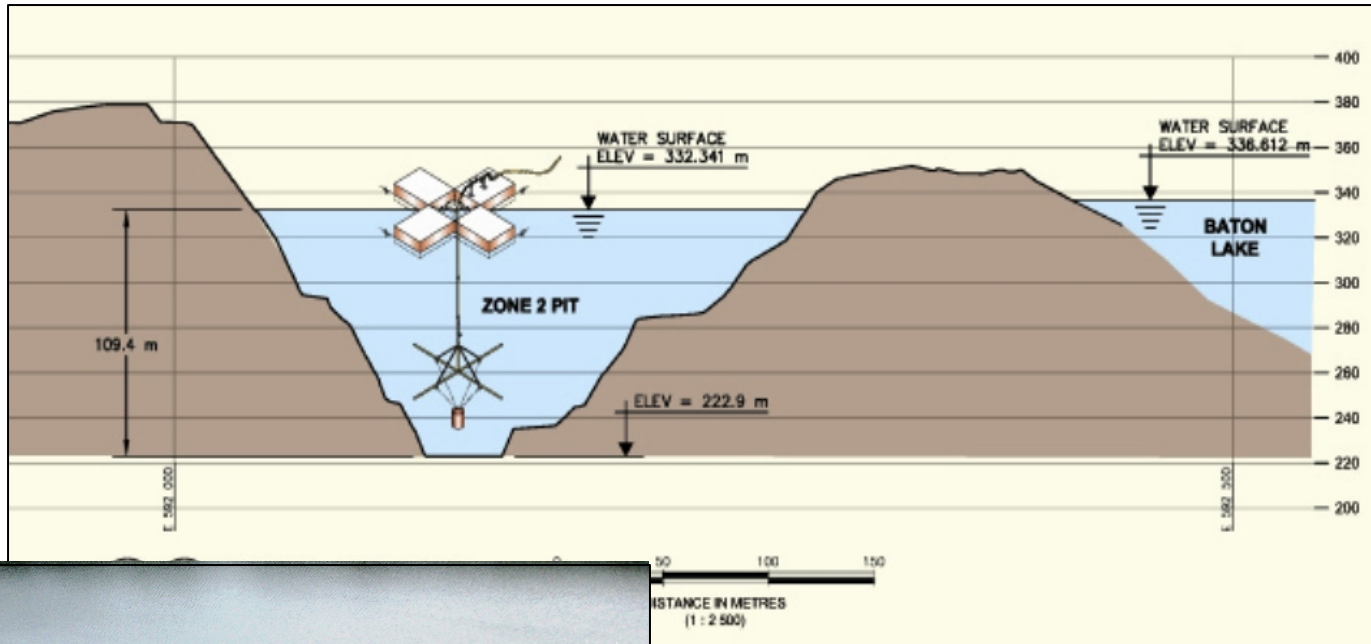


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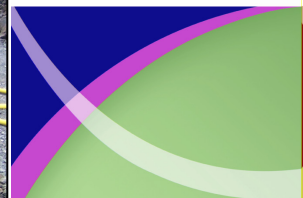




Colomac Water Treatment (deep aeration)



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Colomac Water Treatment (completed Fall 2007)



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Tailings Lake Water Quality



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Colomac Mine Remediation Project

Tailings Management

Major Civil Works

(Dam 1 B, tailings cap, Dyke 7 spillway and
Discharge Channel)

2006-2007



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Colomac Remediation Project



Placing cover on geotextile.

Geotextile and rock cap
placement



Capping progress May





Colomac Tailings Management

Tailings Cap and Dyke 7 spillway –
September 2006



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2006/09/02



Colomac Tailings Management



Spruce
Lake
- 1999



Spruce Lake
- 2007



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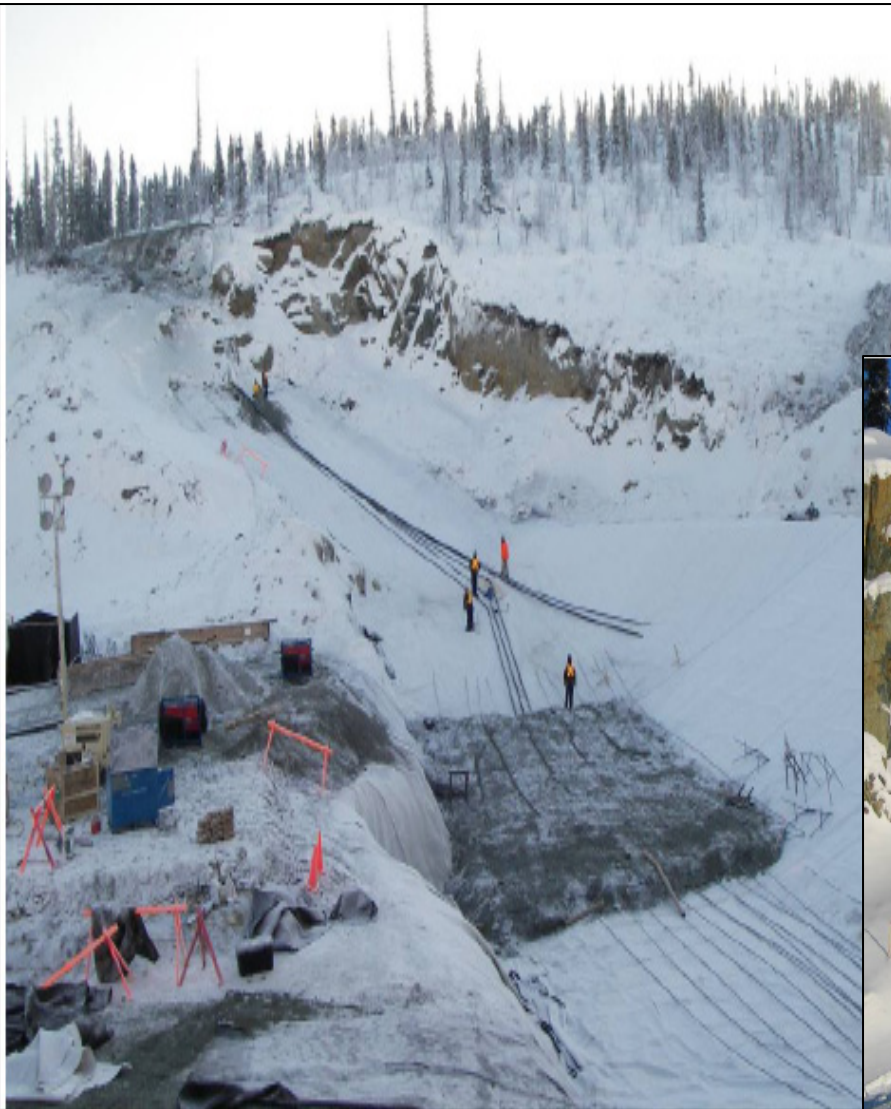
Colomac Dam 1B construction



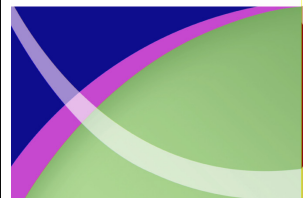
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Colomac Dam 1B construction



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Dam 1B completed – April 2007



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Colomac Mine Remediation Project

Hydrocarbon Remediation



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Colomac Hydrocarbon Remediation: 2004 - 2006



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Colomac Hydrocarbon Impacted Soil Remediation



Soil screening and
windrowing

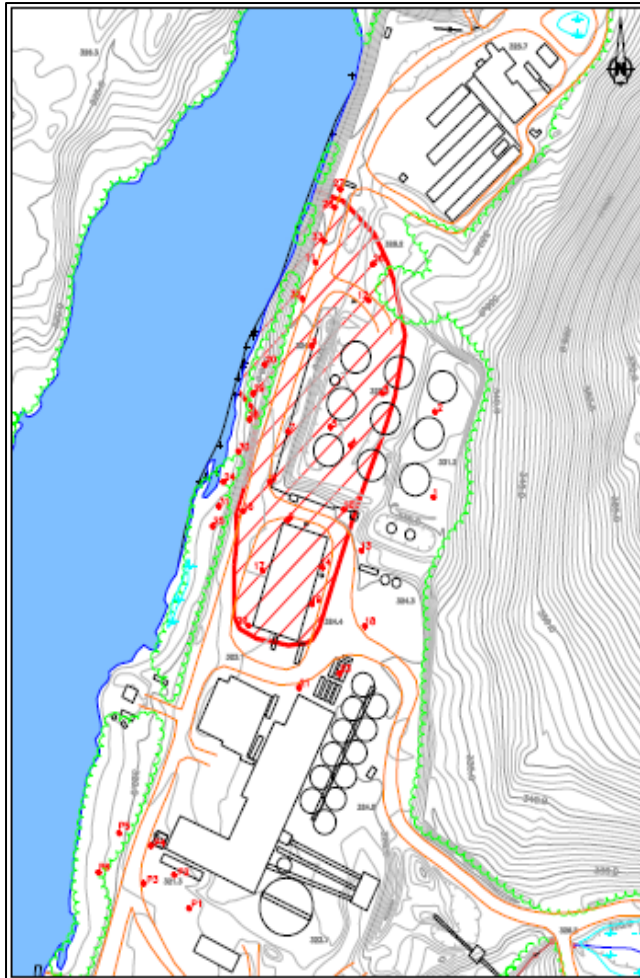


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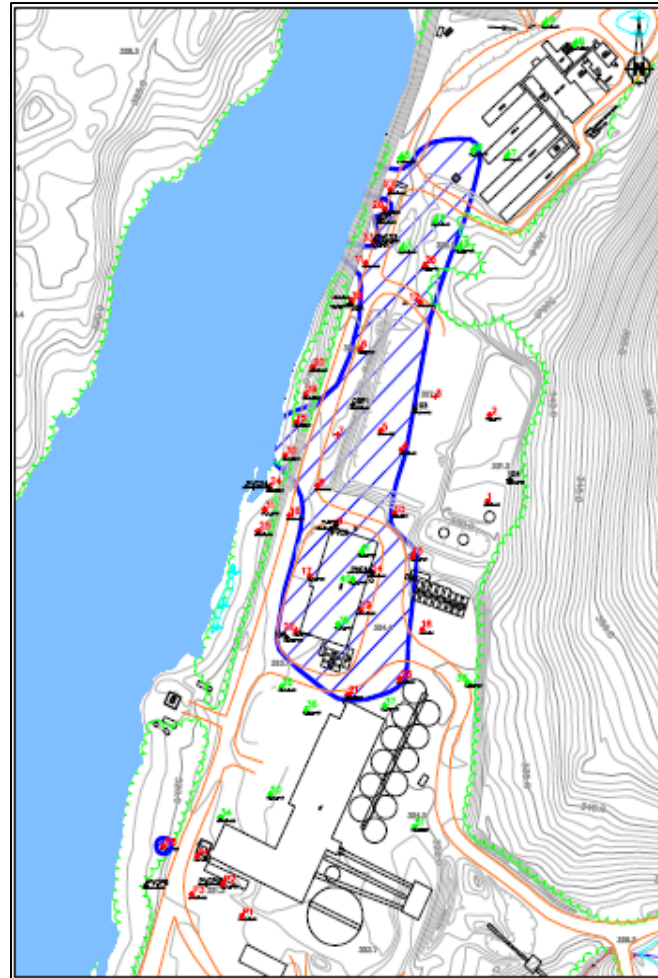


Colomac Free Product Recovery

Product plume - 2000



Product plume - 2007



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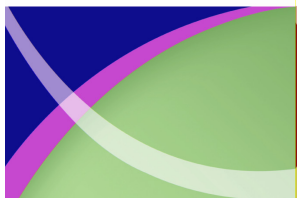




Colomac Free Product Recovery



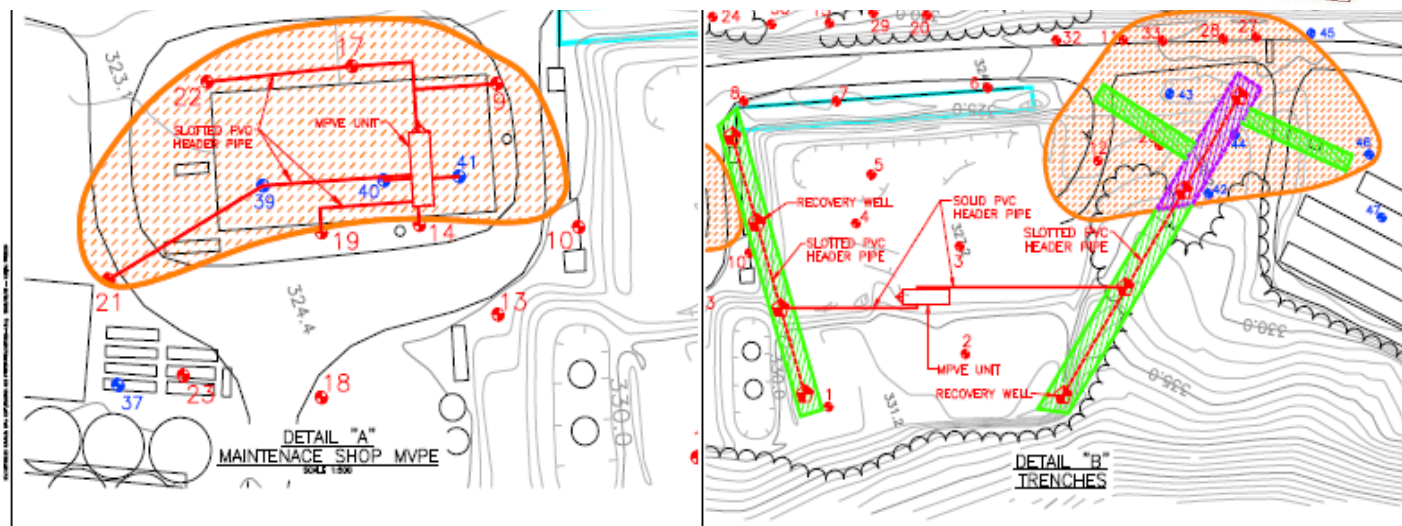
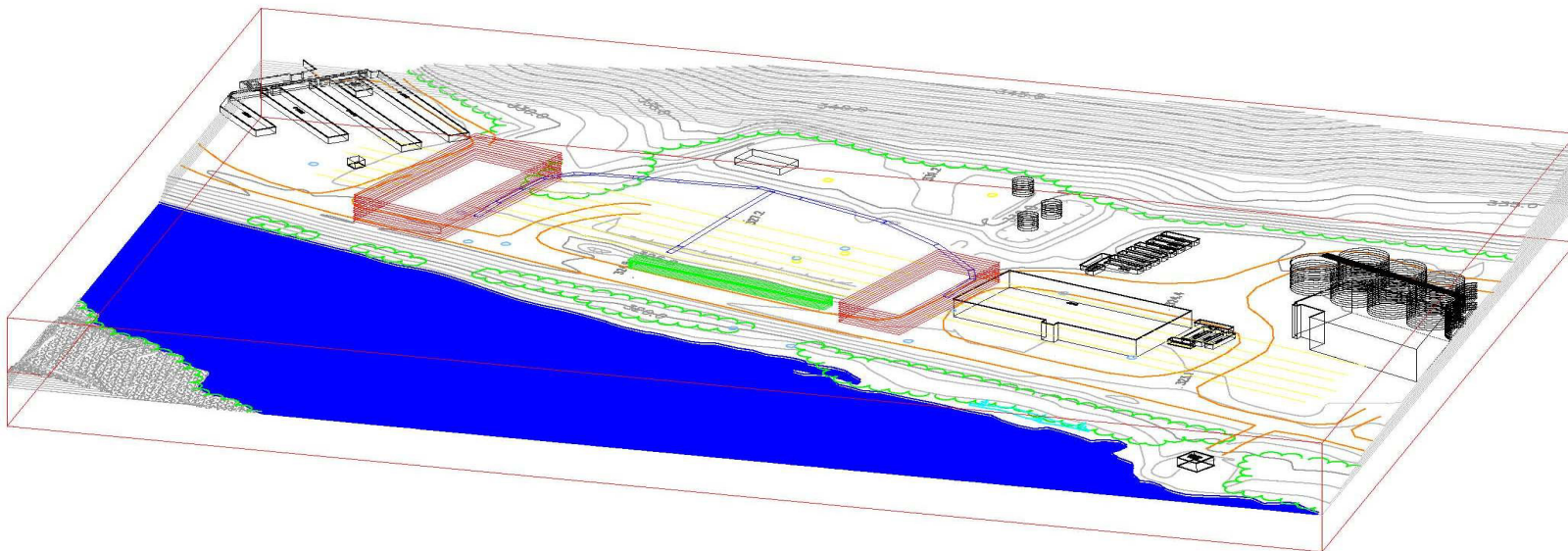
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Colomac Multi-Phase Extraction



| | | |
|---|--------------|---------|
| DATE | DATE | DATE |
| REVISED | REVISED | REVISED |
| NO. | NO. | NO. |
| INDIAN NORTHERN AFFAIRS CANADA | | |
| FREE PHASE PETROLEUM HYDROCARBON PRODUCT RECOVERY | | |
| FORMER COLONIA GOLD MINE, NWT | | |
| CONCEPTUAL MVPE SYSTEM LAYOUT | | |
| | 2006/05/24 | |
| SCALE | 1:500 | |
| DATE | NOV 2006 | |
| PROJECT NO. | 1027392.02-4 | |

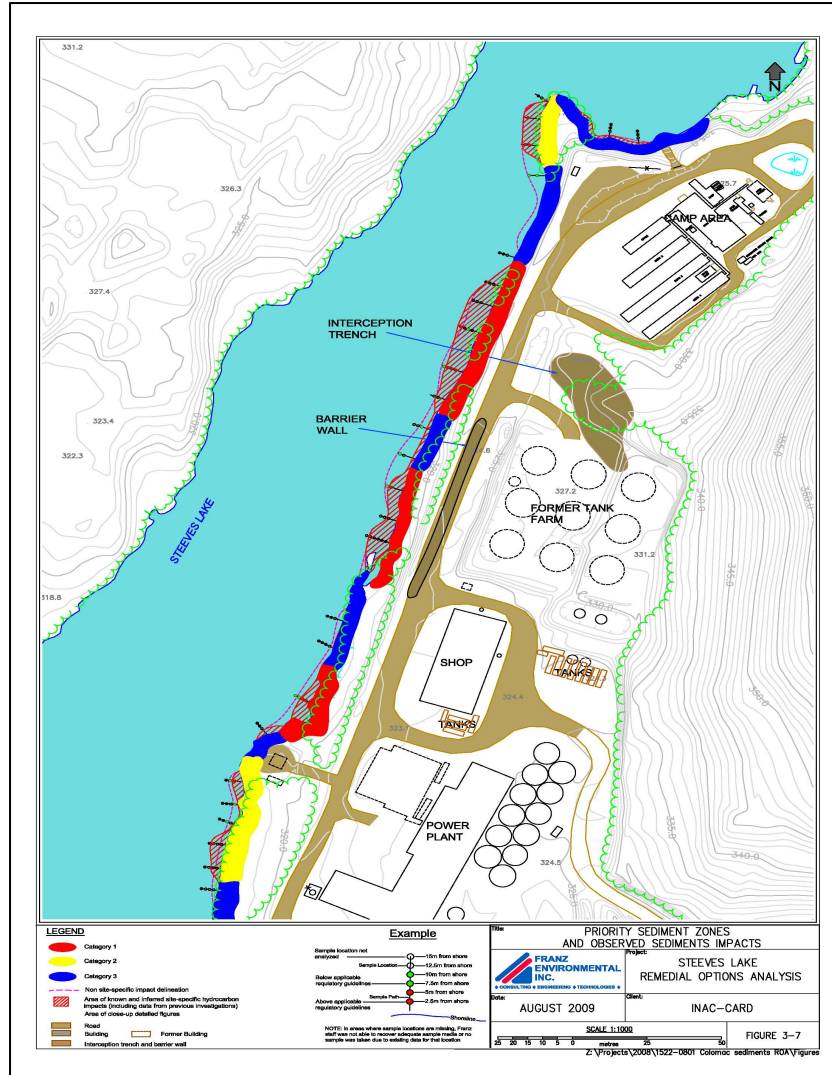


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Steeves Lake Shoreline Impact

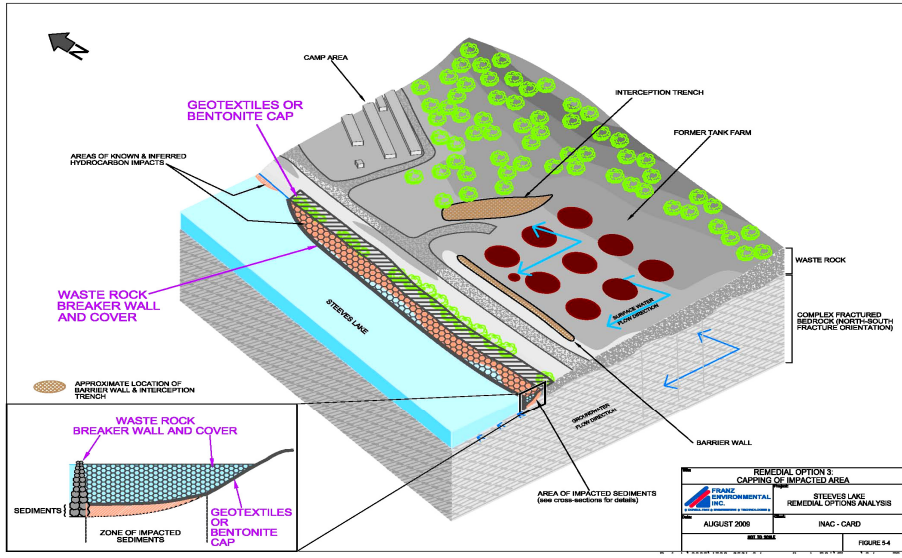


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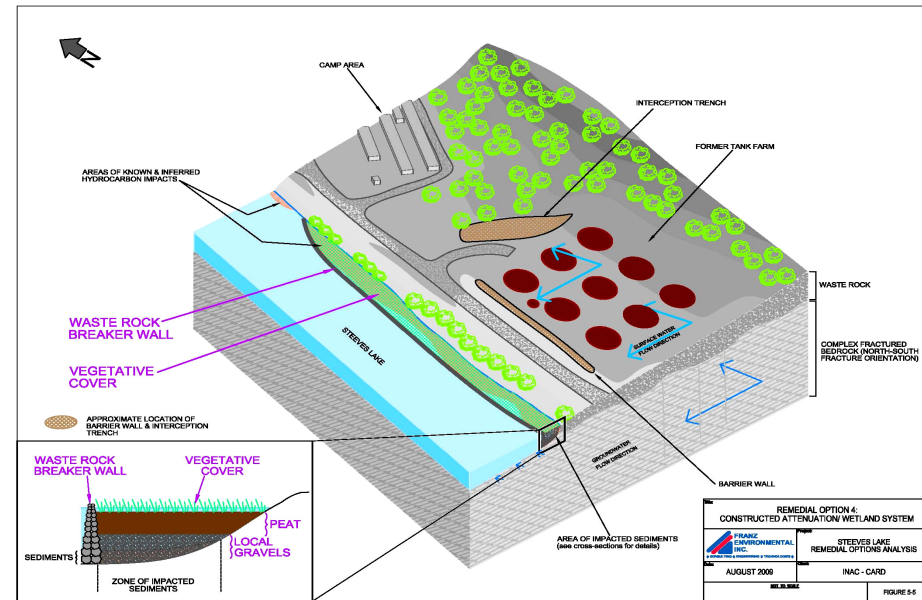


Steeves Lake Shoreline Remedial Options

Capping option



Constructed wetland option





Colomac Mine Remediation Project

Mill asset recovery and salvage

2007-2008



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Colomac Remediation Project

**Mill Asset
Removal
Fall 2007- Winter 2008**



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Colomac Remediation Project

Winter Road Construction 2008



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Colomac Remediation Project

Waste consolidation – Zone 2.5 Pit



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Colomac Mine Remediation Project

Remediation completed to date:

- Tank farm demolition – 2004
- Tank Farm Area excavation, Barrier Wall and LTU construction – 2004-05
- Tailings Lake and Z2.0Pit water treatment – 2007
- Major Civil Works - 2007
- Construction of caribou berms (around waste rock dumps) – 2008
- Waste consolidation - 2008
- Decommissioning of Caribou Fence – 2008
- Waste oil inventory processing – 2008
- Site waste consolidation (including Hewitt Lake camp) -2008



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Colomac Mine Remediation Project

Remediation completed to date:

- Decommissioning of Dam 1 seepage collection system – 2009
- Hazardous material inventory removed – 2009
- High risk quarry remediation – 2009
- Dam 1 valley restoration (Dam 1B spoil removal) – 2009
- Decommissioning of diversion ditches and sumps – 2009
- Treatment of approx 20,000 m³ hydrocarbon impacted soils - 2009



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Colomac Mine Remediation Project

Remaining work (2010-2012)

Major Demolition

- > main mill, primary and secondary – 2010
- > Shop and camp – 2011

Hydrocarbon remediation

- . Enhanced Free Product Recovery (MPE) - 2010 and 2011
- . Steeves Lake Shoreline restoration - 2010
- . LTU and residual impacted soils treatment - 2011



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Colomac Mine Remediation Project

Site Restoration

- . Truck Lake-Steeves Lake channel - 2011
- . Spot Lake channel - 2011
- . Kim-Cass and Duck Lake stream crossings - 2011

Final Site Cleanup and Demob

- . Final waste placement in non-hazardous landfill - 2011
- . Final demob - April 2012



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Colomac Mine Remediation Project

Post Closure

- 5 year program of water quality, hydrological and geotechnical monitoring
- Passive hydrocarbon management program (residual recovery and containment)
- Airstrip left as emergency landing strip
- Future base for Tlicho Gov't winter road and all-weather road construction (??)



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QUESTIONS ?



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