The Faro Mine Legacy

70 million tonnes of tailings and 320 million tonnes of waste rock
Presentation Outline

- Site Overview
  - History
  - Layout
  - Current Conditions
- Closure Plan Concepts
  - Diversions
  - Stabilize and Vegetate Landforms
  - Water Collection and Treatment
- Post-Closure Requirements
- Questions
The Faro Mine Complex is located within the traditional territory of the Kaska Nation.
Faro Mine Complex History

Water from the site flow to the Pelly, River, which then flows into traditional territory of the Selkirk First Nation.

The Town of Faro, established in 1968, now has about 400 residents.
Faro Mine Complex History
Faro Mine Complex - Site Layout

The Amsel Range Mining Complex includes:
- Faro Mine Area
- Rose Creek Tailings Area
- Haul road to Yuneside (32 km)
- Yuneside Plateau area

This project deals only with the Faro Mine and Rose Creek Tailings Areas.

Looking northwest over Mine Area

Looking southwest over Tailings Area

How much waste and tailings is that, really?
- Downstream Whitehorse, from the Walmart to the bridge, covers about 133 hectares. There is enough waste rock at Faro Mine to cover downtown Whitehorse 90 m deep, and enough tailings to add another 30 m!
The five overarching objectives for closure were agreed by Canada, Yukon, Selkirk and Kasheeh:
1. Protect human health and safety.
2. Protect and, to the extent practicable, restore the environment, including land, air, water, fish and wildlife.
3. Return mine site to an acceptable state of use that reflects pre-mine land use where practicable.
5. Manage long-term site risk in a cost-effective manner.

The Faro Mine and Rose Creek Tailings Areas release high levels of contaminants that need to be prevented from entering Rose Creek. The pie chart below shows the loadings that would reach Rose Creek if no closure actions are taken.

Groundwater below the tailings is contaminated with sulphate and metals. Iron and manganese concentrations below the last dam are already sufficient to cause significant contamination of Rose Creek, and are expected to increase over time. Zinc and other metals are expected to arrive in future.

Many buildings are unsafe and contaminated.

Diversion channels and spillways are too small for design floods.

Waste rock and tailings are acid-generating, metal-weathering, hostile to vegetation, and exposed to direct contact by animals.

Faro Creek Diversion threatened by pit slope failure.

Water in Faro Main Pit, and in backfilled Faro Zone 2 pit is acidic and metal-contaminated.

Waste rock slopes are potentially unstable.

Secondary Dam Foundation is liquefiable in a Maximum Credible Earthquake.
Closure Plan - Diversions

Closure Plan Component 3
Keep Clean Water Clean
Extending and/or upgrade
non-contact water diversions

Northwest Perimeter Diversions
Extend and upgrade to 1:100-year capacity

Guardhouse Creek
Extend and upgrade to 1:200-year capacity

New channel on covered waste

New channel on covered tailings

North Fork Rose Creek Diversion
Relocate away from pit wall and upgrade to 1:500-year capacity

New diversions above tailings

Schematic view of extended Rose Creek Diversion Channel
Closure Plan Component 2
Stabilize and Revegetate Landforms
Re-shape, cover, revegetate and establish surface drainage on waste rock and tailings

Rose Creek Tailings Area

1. Stabilize dams
   - Add buttress to Intermediate Dam
   - Blast densify foundation of Secondary Dam

2. Landform surface
   - Use material from expansion of Rose Creek Diversion Channel to create a mounded surface

2. Construct cover
   - Cover all tailings surfaces. Profile is designed to support vegetation growth

3. Establish drainage and revegetate
   - Include expansion of Intermediate Dam spillway to convey local PMF
Closure Plan Component 2
Stabilize and Revegetate Landforms
Re-shape, cover, revegetate and establish surface drainage on waste rock and tailings

Faro Mine Area
1. Relocate low grade ore and regrade slopes
   Low grade ore will be relocated to a central pile so it can be covered more efficiently.

2. Construct three type of cover
   - Isolation Cover
   - Low Infiltration
   - Very Low Infiltration

3. Establish drainage

4. Seed and plant vegetation
   Early establishment to minimize erosion.
   Variety of seed mixes for slopes, flats, dry areas, moist areas.
   Planting to create vegetated drainage swales.
Closure Plan - Water Treatment and Collection

Closure Plan Component 1
Collect & Treat Contact Water
Improve and expand contact water collection systems
Build new water treatment plant

New Water Treatment Plant
Lime Addition - High Density Sludge system
Constructed in mill area
Seasonal operation at 54,000 m³/d

Treated Water
Discharged to Rose Creek

Clarifier

Lime
Influent
Recycle
Sludge

Faro Pit
Contact water from all sources stored for seasonal treatment

Zone 2 Pit
Wells in backfill return seepage to main pit

Down Valley Seepage Interception System
Four lines of groundwater capture and monitoring

Emergency Tailings Area Seepage Interception
Three lines of surface and groundwater capture

North Fork Rose Creek Seepage Interception
Multiple groundwater capture systems and surface water diversions
Thank you and questions?