

Faro Mine Closure

Arriving at a Closure Plan



January 2008



Faro Mine Closure - History

1969 - The Faro Mine officially opened.

1998 - The mine's final owner was placed into receivership and all mining operations stopped.

2003 - The federal and Yukon governments acknowledged that the mine would not reopen. With the Ross River Dena Council (on behalf of the Kaska Nation) and Selkirk First Nation, they began working together to develop a closure and remediation plan for the Faro Mine Complex.



Closure planning over the years

Many different plans have been proposed for addressing the environmental issues at the Faro Mine Complex:

1981 Tailings Abandonment Plan

1988 Curragh Resources Abandonment Submission

1991 Down Valley Tailings Abandonment Plan

1996 Integrated Comprehensive Abandonment Plan (ICAP)



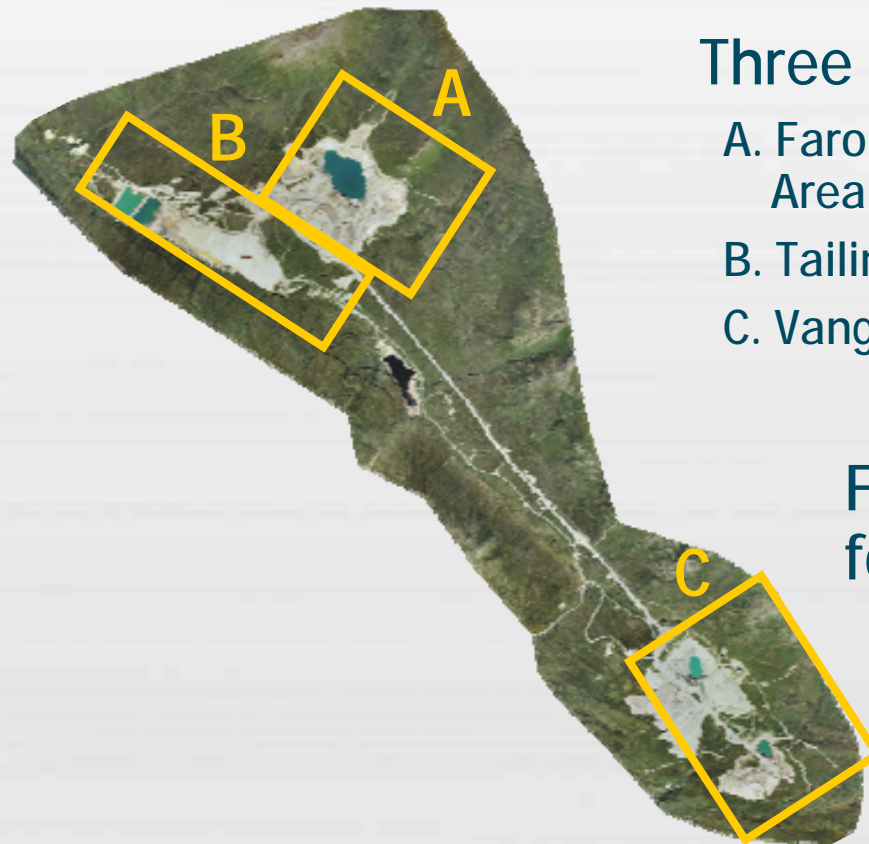
Understanding the issues

To create a complete final closure and remediation plan, we gathered and studied information on a wide range of environmental issues.

- From 2002 to 2005 - conducted technical workshops with consultants, governments (federal, territorial, First Nation, municipal), regulatory agencies, and others.
- From 2003 to 2006 - completed over 90 technical studies.

2006 - Example Alternatives

From the studies and the workshop results, we created 12 “example alternatives”.



Three areas

- A. Faro Pit and Waste Rock Area
- B. Tailings Area
- C. Vangorda/Grum Area

Four alternatives
for each area

12 total



2007 – Further Narrowing the Options

During 2006 and 2007, the 12 example alternatives were subject to:

- Independent Peer Review
- Community input
- Further technical studies

This allowed us to refine and condense the
12 example alternatives
into
5 closure options

2007 - Closure Options

We now have 5 closure options.

Two areas

A. Faro Mine Area

(this combines the Faro Pit and Waste Rock with the Tailings Area)

B. Vangorda/Grum Area

3 options for the Faro Mine Area

2 options for the Vangorda/Grum Area

5 total



2007 – 5 Closure Options in Two Areas

Combined Faro Mine Area

Move All Tailings

+

Upgrade Faro Creek
Diversion and
Cover/Revegetate
Faro Waste Rock

OR

Cover Tailings with
Soil

+

Upgrade Faro Creek
Diversion and
Cover/Revegetate
Faro Waste Rock

OR

Move Some Tailings
and Cover Some
Tailings with Soil

+

Upgrade Faro Creek
Diversion and
Cover/Revegetate
Faro Waste Rock

= 3 Combined Options

Vangorda/Grum Mine Area

Move Vangorda Waste Rock
into Vangorda Pit

OR

Cover Vangorda Waste
Rock in Place

= 2 Options



Common Elements of the Options

(1)

Any overall closure plan for the Faro Mine Complex will include some common things:

- Resloping and covering waste rock
- Revegetation of soil covers and other areas
- Diversion of clean water around the site
- Long-term collection and treatment of contaminated water
- Long-term management of water treatment sludge
- Long-term storage of water in pits
- Long-term maintenance of remaining site facilities (diversions, covers, water collection systems, water treatment systems, dams, etc.)
- Long-term monitoring of environmental conditions (water, animals, plants, climate, etc.)



Common Elements of the Options

(2)

All of the closure options for the Faro Mine Complex are designed to do the following:

- Avoid unacceptable risks to public health and safety
- Avoid unacceptable risks to worker health and safety
- Meet appropriate environmental standards and guidelines, etc.



Combined Faro Mine Area Option 1

Upgrade Faro Creek diversion
Reslope, cover and revegetate Faro
waste rock

Move all tailings

Estimated Jobs: 975 person years

Estimated Cost: \$590 M

Combined Faro Mine Area Option 1: Upgrade Faro Creek Diversion / Cover Faro Waste Rock

Closure Approach

What is involved?

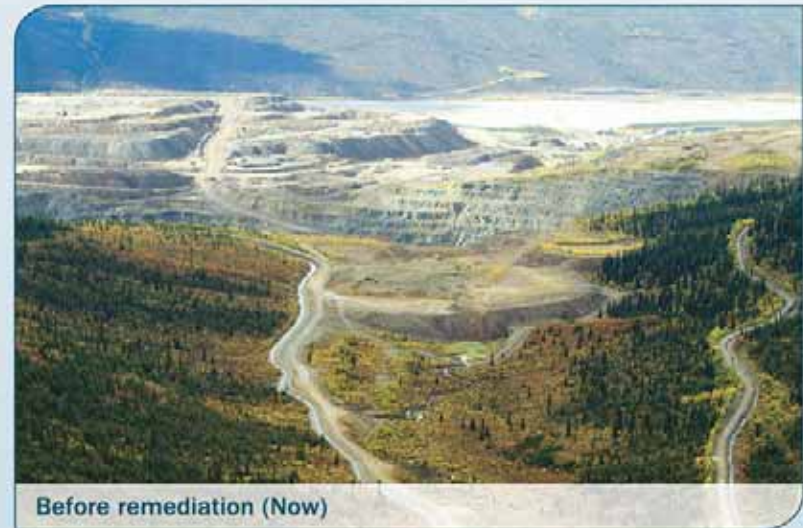
- Build new diversion channel for Faro Creek
 - Remove North Fork Rock Drain
 - Build lined channel for North Fork Rose Creek
 - Waste Rock
 - Reslope and cover with soil
 - Possibly move some waste rock to Faro Pit
 - Revegetate covered waste rock
- Move tailings from Emergency Tailings Area to Faro Pit or Tailings Area.
 - Collect and treat contaminated water from below waste rock, Zone 2 Pit and in Faro Pit (100s of years)
 - Maintain covers and channels (100s of years)
 - Monitor environmental conditions and adapt to changes

Estimated cost to build and maintain: \$150M

Estimated employment: 230 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.



** Image for inspiration purposes only*

Combined Faro Mine Area Option 1: Move all tailings

Move All Tailings to Faro Pit

What is involved?

- Mix tailings with lime and water
- Pump tailings to Faro Pit
- Clean up remaining tailings with trucks and loaders
- Collect and treat contaminated water from under tailings (20 years?)
- Cut through dams and revegetate valley
- Construct channel for Rose Creek and put Rose Creek back in the valley when soil and water are clean
- May have to collect and treat contaminated water from mine area in Rose Creek Valley (100s of years)
- Monitor environmental conditions and adapt to changes

Estimated cost to build and maintain: \$440M

Estimated employment: 745 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.



Image for illustration purposes only.



Combined Faro Mine Area Option 2

Upgrade Faro Creek diversion
Reslope, cover and revegetate Faro
waste rock

Cover tailings with soil

Estimated Jobs: 566 person years

Estimated Cost: \$410 M

Combined Faro Mine Area Option 2: Upgrade Faro Creek Diversion / Cover Faro Waste Rock

Closure Approach

What is involved?

- Build new diversion channel for Faro Creek
 - Remove North Fork Rock Drain
 - Build lined channel for North Fork Rose Creek
 - Waste Rock
 - Reslope and cover with soil
 - Possibly move some waste rock to Faro Pit
 - Revegetate covered waste rock
- Move tailings from Emergency Tailings Area to Faro Pit or Tailings Area.
 - Collect and treat contaminated water from below waste rock, Zone 2 Pit and in Faro Pit (100s of years)
 - Maintain covers and channels (100s of years)
 - Monitor environmental conditions and adapt to changes

Estimated cost to build and maintain: \$150M

Estimated employment: 230 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.



Image for illustration purposes only

Combined Faro Mine Area Option 2: Cover tailings with soil

Cover Tailings with Soil

What is involved?

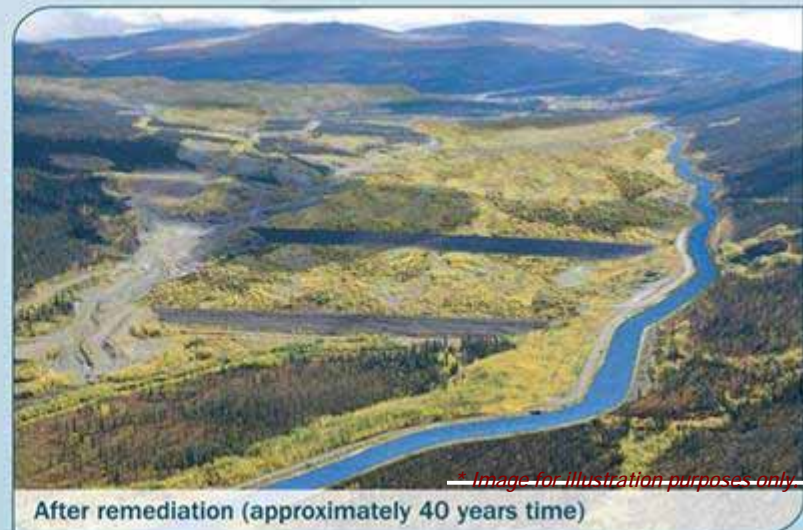
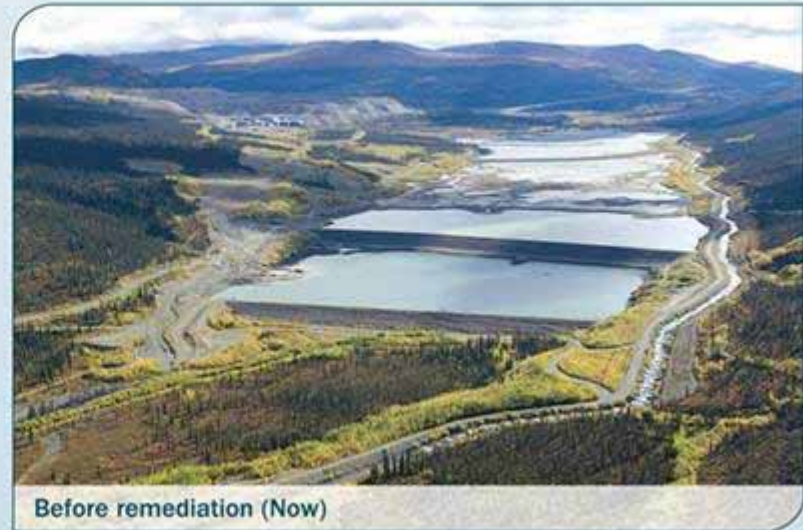
- Remove Cross-Valley Dam or change/upgrade it for emergency water storage
- Stabilize Second Dam
- Regrade tailings and cover with waste rock and soil
- Revegetate covered tailings and other areas
- Build/upgrade diversions, channels and spillways to deal with floods
- Collect and treat contaminated water from valley (100s of years)
- Maintain covers, channels and dams (100s of years)
- Monitor environmental conditions and adapt to changes

Estimated cost to build and maintain: \$260M

Estimated employment: 336 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.





Combined Faro Mine Area Option 3

Upgrade Faro Creek diversion
Reslope, cover and revegetate Faro
waste rock

Move some tailings and cover
some tailings with soil

Estimated Jobs: 782 person years

Estimated Cost: \$490 M

Combined Faro Mine Area Option 3: Upgrade Faro Creek Diversion / Cover Faro Waste Rock

Closure Approach

What is involved?

- Build new diversion channel for Faro Creek
 - Remove North Fork Rock Drain
 - Build lined channel for North Fork Rose Creek
 - Waste Rock
 - Reslope and cover with soil
 - Possibly move some waste rock to Faro Pit
 - Revegetate covered waste rock
- Move tailings from Emergency Tailings Area to Faro Pit or Tailings Area.
 - Collect and treat contaminated water from below waste rock, Zone 2 Pit and in Faro Pit (100s of years)
 - Maintain covers and channels (100s of years)
 - Monitor environmental conditions and adapt to changes

Estimated cost to build and maintain: \$150M

Estimated employment: 230 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.



Image for illustrative purposes only

Combined Faro Mine Area Option 3: Move some tailings and cover some tailings with soil

Move Some Tailings and Cover Some Tailings

What is involved?

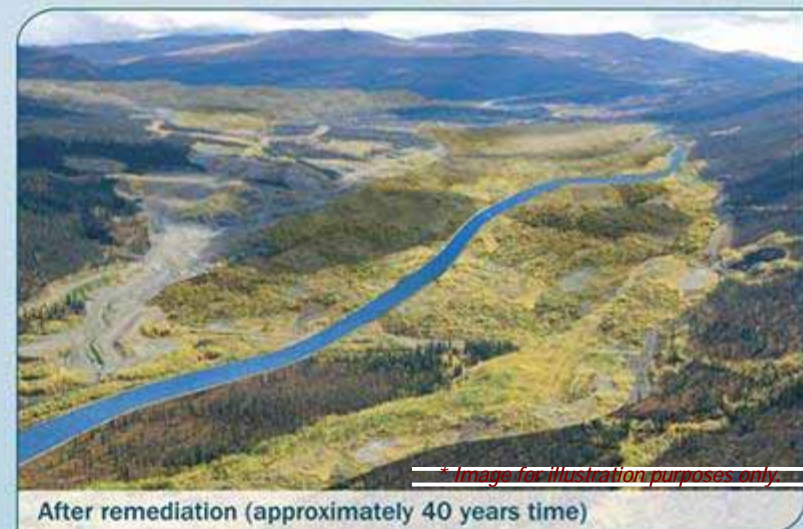
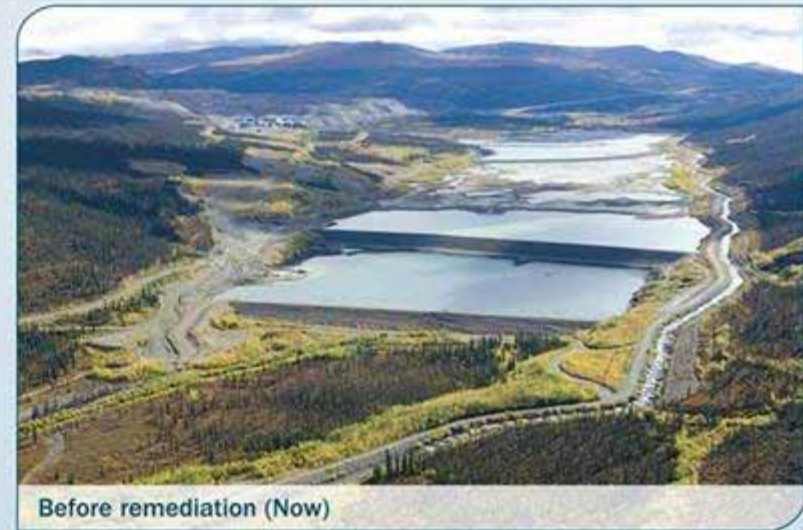
- Remove Cross-Valley Dam or change/upgrade it for emergency water storage
- Stabilize Second Dam
- Mix Intermediate Tailings with lime/water and pump to Faro Pit
- Clean up remaining Intermediate Tailings with trucks and loaders
- Regrade Original and Second Tailings and cover with waste rock and soil
- Revegetate covered tailings and valley area
- Upgrade diversion channel for upper part of Rose Creek
- Construct channel for lower part of Rose Creek and return the creek to the valley when soil and water are clean
- Collect and treat contaminated water (100s of years)
- Maintain covers, channels and dams (100s of years)
- Monitor environmental conditions and adapt to changes

Estimated cost to build and maintain: \$340M

Estimated employment: 552 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.



** Image for illustration purposes only*



Vangorda/Grum Area Option 1

Reslope, cover and revegetate
Grum waste rock

Move Vangorda Waste Rock into
Vangorda Pit

Estimated Jobs: 225 person years

Estimated Cost: \$110 M

Vangorda/Grum Area Option 1

Move Vangorda Waste Rock into Vangorda Pit

What is involved?

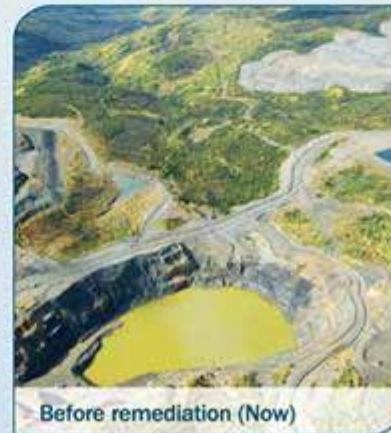
- Mix Vangorda Waste rock with lime and place in Vangorda Pit
- Reslope Grum Waste Rock
- Cover Grum Waste Rock and relocated Vangorda Waste Rock with soil
- Revegetate covered waste rock and other areas
- Build new channel for Vangorda Creek – over filled pit
- Collect and treat contaminated water from Grum Waste Rock and Grum Pit (100s of years)
- Possibly collect and treat contaminated water from Vangorda Pit
- Maintain covers and channels (100s of years)
- Monitor environmental conditions and adapt to changes

Estimated cost to build and maintain: \$110M

Estimated employment: 225 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.



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Vangorda/Grum Area Option 2

Reslope, cover and revegetate Grum waste
rock

Cover Vangorda waste rock in place

Estimated Jobs: 80 person years

Estimated Cost: \$80 M

Vangorda/Grum Area Option 2

Cover Vangorda Waste Rock In-Place

What is involved?

- Reslope Vangorda and Grum Waste Rock and cover with soil
- Revegetate covered waste rock and other areas
- Build new diversion channel for Vangorda Creek
- Collect and treat contaminated water from

Grum and Vangorda Waste Rock and Grum and Vangorda Pits (100s of years)

- Maintain channels and covers (100s of years)
- Monitor environmental conditions and adapt to changes


Estimated cost to build and maintain: \$80M

Estimated employment: 80 person years

Each option is designed to meet technical and environmental standards.

An overall closure plan will be created by choosing one option for the Faro Mine Area and one for the Vangorda/Grum Area.





So how do we get
from
5 options
to
a closure plan?





Closure Objectives

There are 5 things, or *objectives*, we want a closure plan to achieve:

1. Protect human health & safety
2. Protect, and to the extent practicable, restore the environment including land, air, water, fish and wildlife
3. Return the mine site to an acceptable state of use that reflects pre-mining land use where practicable
4. Maximize local and Yukon socio-economic benefits
5. Manage long-term site risk in a cost effective manner

Final Closure Plan Options

A final closure and remediation plan will be created from:



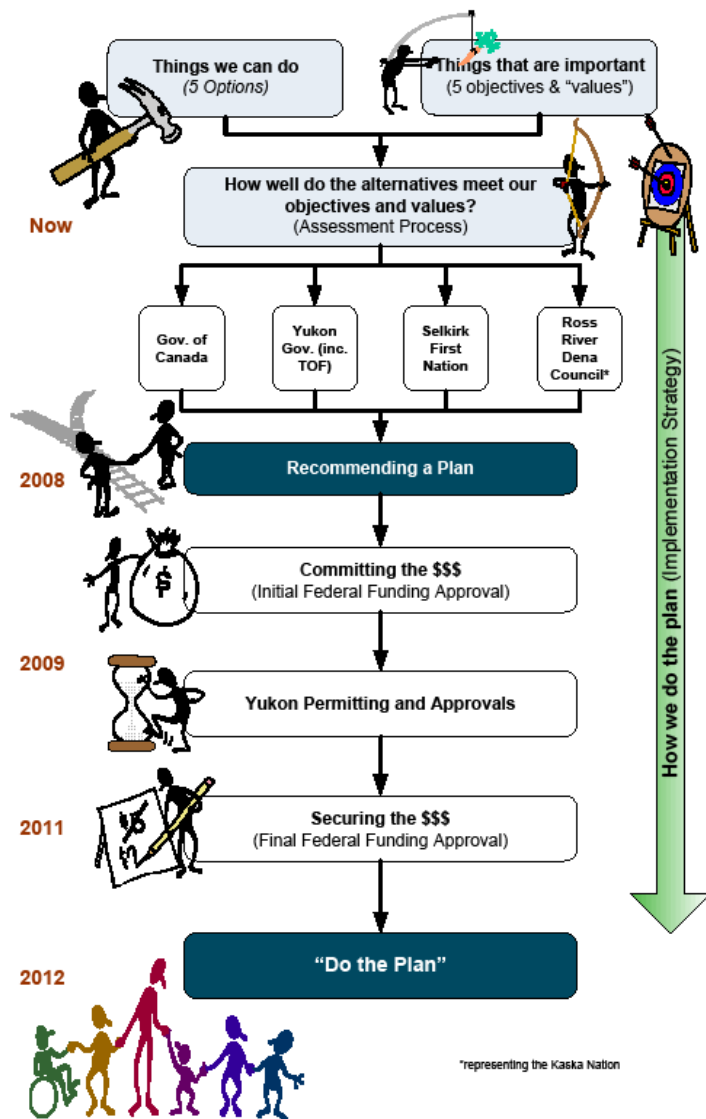
ONE option for the Faro Mine Area

+

ONE option for the Vangorda/Grum Area

and will be designed to meet all of the stated closure objectives.

Next Steps: Roadmap to Remediation



- The communities and governments are now conducting their own assessment processes.
- Information from these processes will be used by the project Oversight Committee to arrive at a final closure and remediation plan to recommend to the federal government for initial funding approval.

For more information,
please contact your community office:



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