Faro Mine Remediation Project

Presentation to YSSC

Feb 22, 2021

Presentation Outline

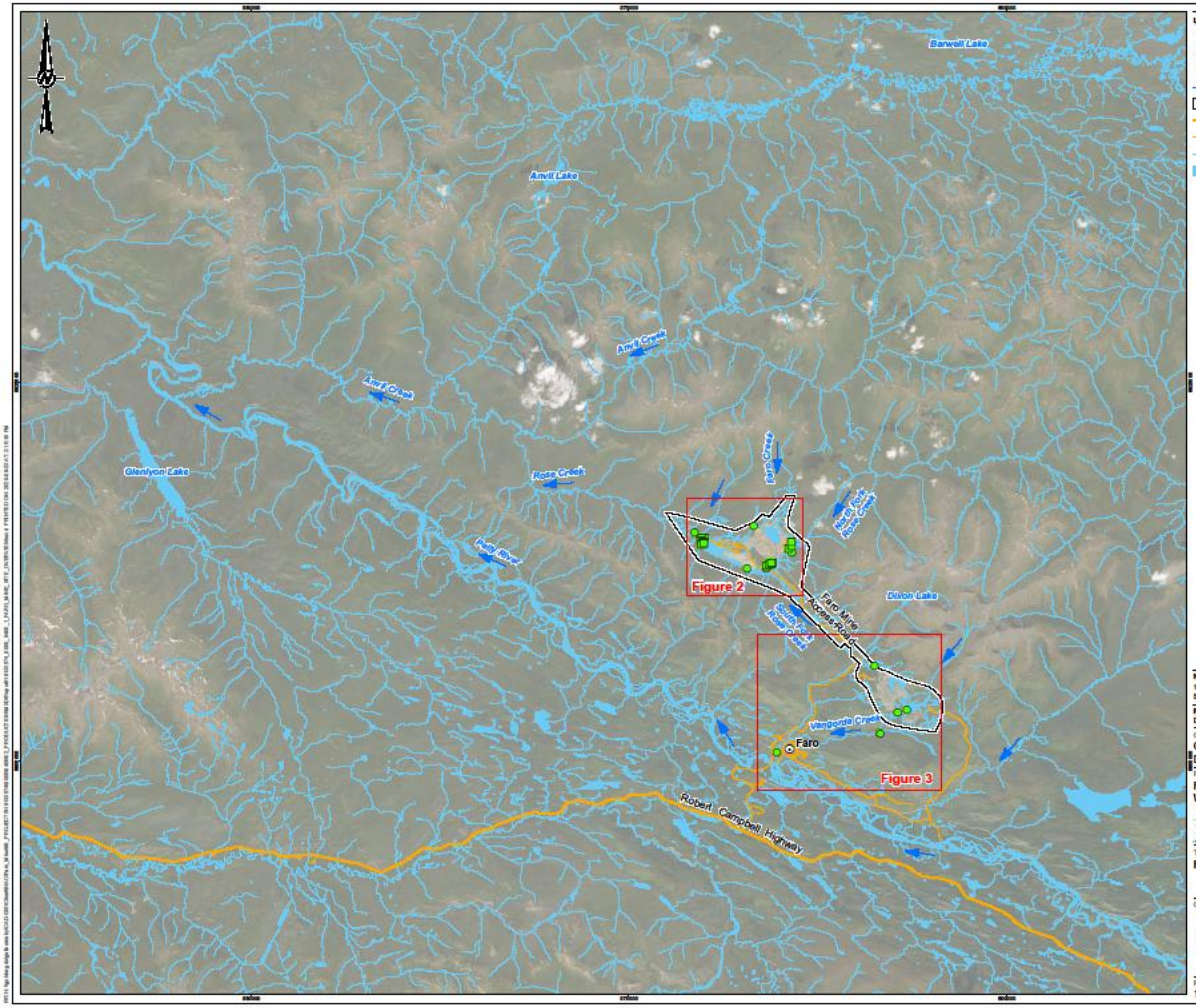
1.Faro Mine Background and History

2. Quartz Mining 101

3. SFN YESAB EC Workshop Project Scope Presentation

Faro Mine Background and History

- Opened around 1969 by Cyrus Anvil Range and operated until 1998 when the last owner went bankrupt
- One of the largest open pit lead zinc mines in the world with footprint of 25 km2
- The 2nd most contaminated site in Canada with 70 million tons of tailings and 320 million tons of waste rock that is acidifying and releasing heavy metals such as Zinc, Iron, Manganese, Cobalt, Sulphate and Arsenic into surface and groundwater in the Pelly drainage
- Release of these contaminants predicted to increase for the next 50 years or more
- Vangorda mine site open in 1993 and connected to Faro site by a haul road



LEGEND

- GROUNDWATER SAMPLING LOCATION
- SURFACE WATER SAMPLING LOCATION
- TOWN
- DIRECTION OF FLOW
- FARO MINE COMPLEX SAMPLING AREA
- HIGHWAY
- ROAD
- WATERCOURSE
- WATERBODY

0 5 10

1:250,000 KILOMETRES

NOTE(S)

1. STATION 09BC004: PELLY RIVER BELOW VANGORDA CREEK IS OPERATED BY THE WATER SURVEY OF CANADA.

REFERENCE(S)

DATUM: NAD83 CSRS PROJECTION: UTM ZONE 8

CLIENT

CROWN-INDIGENOUS RELATIONS AND NORTHERN DEVELOPMENT

PROJECT

FARO OPERATIONAL ADAPTIVE MANAGEMENT PLAN 2020 WORKSHOP

Faro Mine Remediation Project
Projet d'assainissement de la mine Faro

TITLE

FARO MINE COMPLEX - SITE OVERVIEW

CONSULTANT

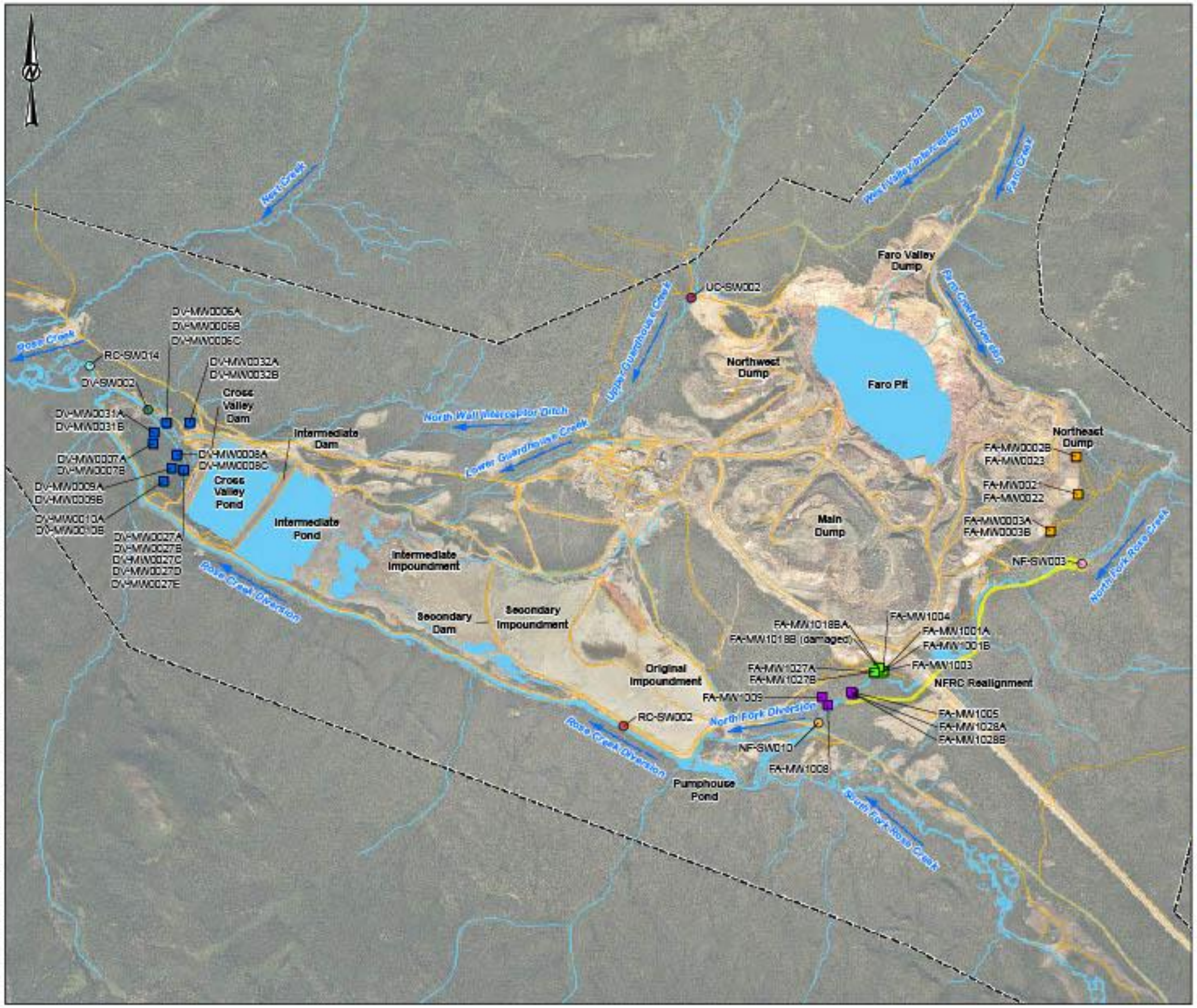
GOLDER

YYYY-MM-DD	2020-09-23
DESIGNED	AN
PREPARED	LH
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
19133574	8000/8400	A	1

Quartz Mining 101
Key Mine Features

- Mine Pit
- Ore Crusher
- Waste Rock Dumps
- Tailings Ponds



Faro Valley Dump
UC-SW002
Northwest Dump
Faro Pit
Northeast Dump
Main Dump
Rose Creek
RC-SW014
DV-SW002
DV-MW0006A
DV-MW0006B
DV-MW0006C
DV-MW0032A
DV-MW0032B
Cross Valley Dam
DV-MW0031A
DV-MW0031B
DV-MW0008A
DV-MW0008C
DV-MW0007A
DV-MW0007B
DV-MW0009A
DV-MW0009B
DV-MW0010A
DV-MW0010B
DV-MW0027A
DV-MW0027B
DV-MW0027C
DV-MW0027D
DV-MW0027E
Cross Valley Pond
Intermediate Dam
Intermediate Pond
Intermediate Impoundment
Secondary Dam
Secondary Impoundment
Original Impoundment
North Wall Interceptor Ditch
Lower Guardhouse Creek
Upper Guardhouse Creek
West Valley Interceptor Ditch
Faro Creek
Faro Creek Diversion
North Fork Rose Creek
Rose Creek Diversion
North Fork Diversion
South Fork Rose Creek
Pumphouse Pond
FA-MW0002B
FA-MW0023
FA-MW0021
FA-MW0022
FA-MW0003A
FA-MW0003B
NF-SW003
FA-MW1018BA
FA-MW1018B (damaged)
FA-MW1004
FA-MW1001A
FA-MW1001B
FA-MW1003
FA-MW1027A
FA-MW1027B
NFRC Realignment
FA-MW1009
FA-MW1005
FA-MW1028A
FA-MW1028B
RC-SW002
NF-SW010
FA-MW1008

LEGEND

- FARO MINE COMPLEX SAMPLING AREA
- ROAD
- DIRECTION OF FLOW
- NFRC REALIGNMENT
- WATERCOURSE
- WATERBODY

GROUNDWATER SAMPLING LOCATION / EVENT

- NFRC-2
- NFRC-4
- NFRC-5
- RC-3

SURFACE WATER SAMPLING LOCATION / EVENT

- NFRC-1
- NFRC-3
- RC-1
- RC-2
- RC-4
- UGC-1

0 500 1,000

1:35,000 METRES

NOTE(S)

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TITLE

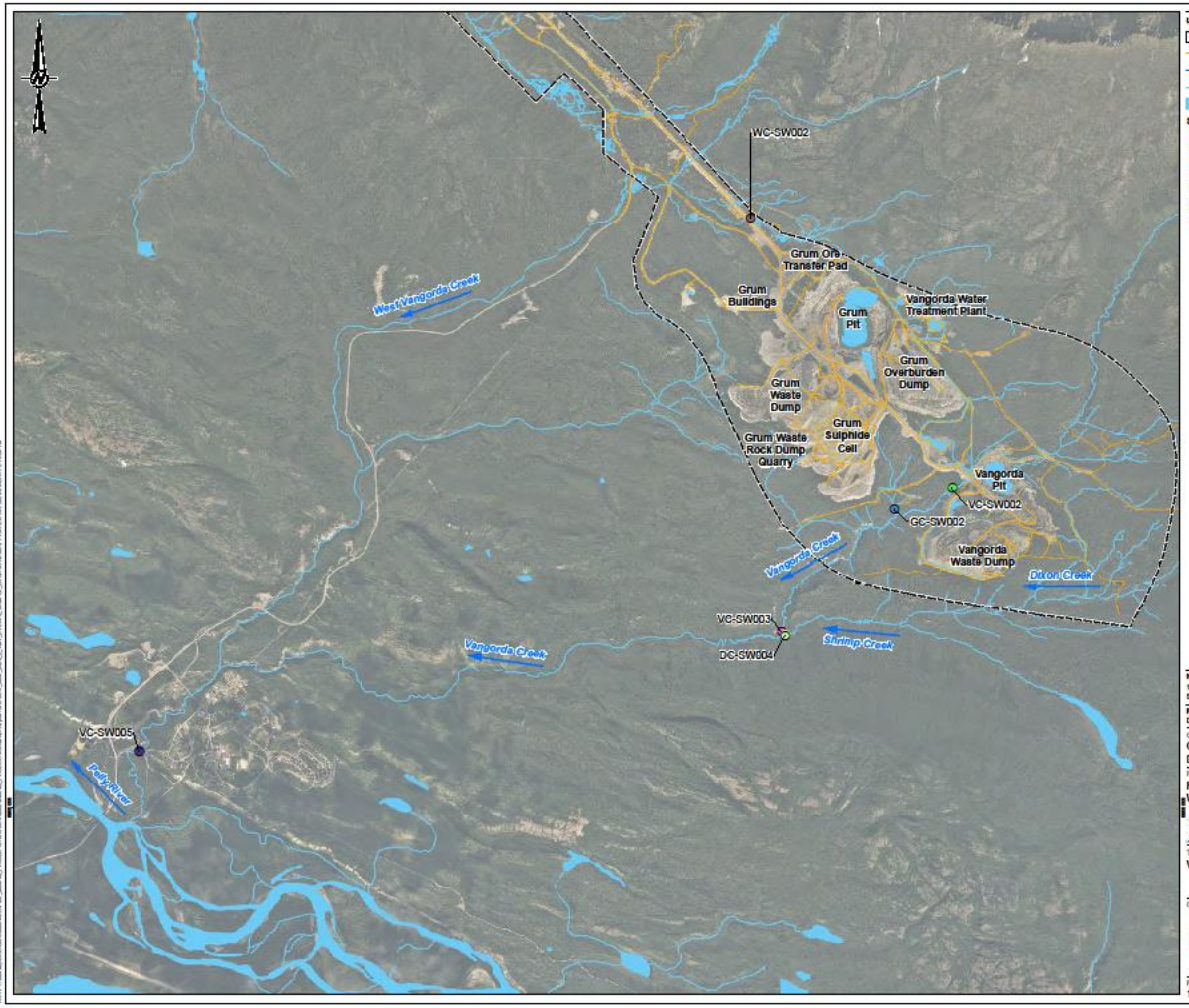
FARO MINE SITE - GENERAL LAYOUT

CONSULTANT

GOLDER

YYYY-MM-DD	2020-09-23
DESIGNED	AH
PREPARED	LH
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
19133574	8000/8400	A	2



LEGEND

- FARO MINE COMPLEX SAMPLING AREA
- ROAD
- DIRECTION OF FLOW
- WATERCOURSE
- WATERBODY

SURFACE WATER SAMPLING LOCATION / EVENT

- VG-1
- VG-2
- VG-3
- VG-4
- VG-5
- VG-6

KEY MAP

0 800 1,600

1:40,000 METRES

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TITLE

VANGORDA AREA - GENERAL SITE LAYOUT

CONSULTANT

GOLDER

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19133574	8000/8400	A	3

Key Faro Remediation Measures

1. Route clean water around mine site and design for 1 in 200 year flood
2. System of wells to intercept contaminated groundwater and pump up and store in pit for treatment
3. Treatment of contaminated water from pit during the winter release below mine site
4. Install impervious clay/soil covers on waste rock dumps and tailings facilities to reduce infiltration of rain and snow and leaching of contaminants into downstream surface and groundwater
5. Estimated cost $30+ million a year ~ $1 Billion over 25 years

Key Remediation issues and uncertainties

- Waste rock dumps are acidifying and groundwater contamination is rapidly increasing and moving downstream
- High level of uncertainty on rate of acidification of waste rock dumps and tailings facilities over long term and resulting levels of contaminants in groundwater
- Assumptions are that most contaminated groundwater will be intercepted but a high level of uncertainly about contaminant levels– so even a little seepage can have high impact on downstream water quality
- Lag time to construct and upgrade collection and treatment facilities and problems identified by monitoring
- What is the appropriate baseline – current or pre-mining