



# **Doris North Project**



**NWB PUBLIC HEARING  
August 13-15, 2007  
Cambridge Bay, Nunavut**

# Presentation Outline

- ◆ **Doris North Project Overview**
- ◆ **Planned Water Use**
- ◆ **General Conditions**
  - ◆ **License Term**
  - ◆ **Compensation Measures**
- ◆ **Waste Disposal**
  - ◆ **Mill Tailings**
  - ◆ **Sewage**
  - ◆ **Garbage**
  - ◆ **Other Hazardous Wastes**

# Presentation Outline

- ◆ **Water Management**
  - ◆ Tail Lake
  - ◆ Storm water
- ◆ **Environmental Management System**
- ◆ **Environmental Performance Monitoring**
- ◆ **Closure and Reclamation Planning**
- ◆ **Financial Security**
- ◆ **Potential Future Development**

# Introduction of the Miramar Team

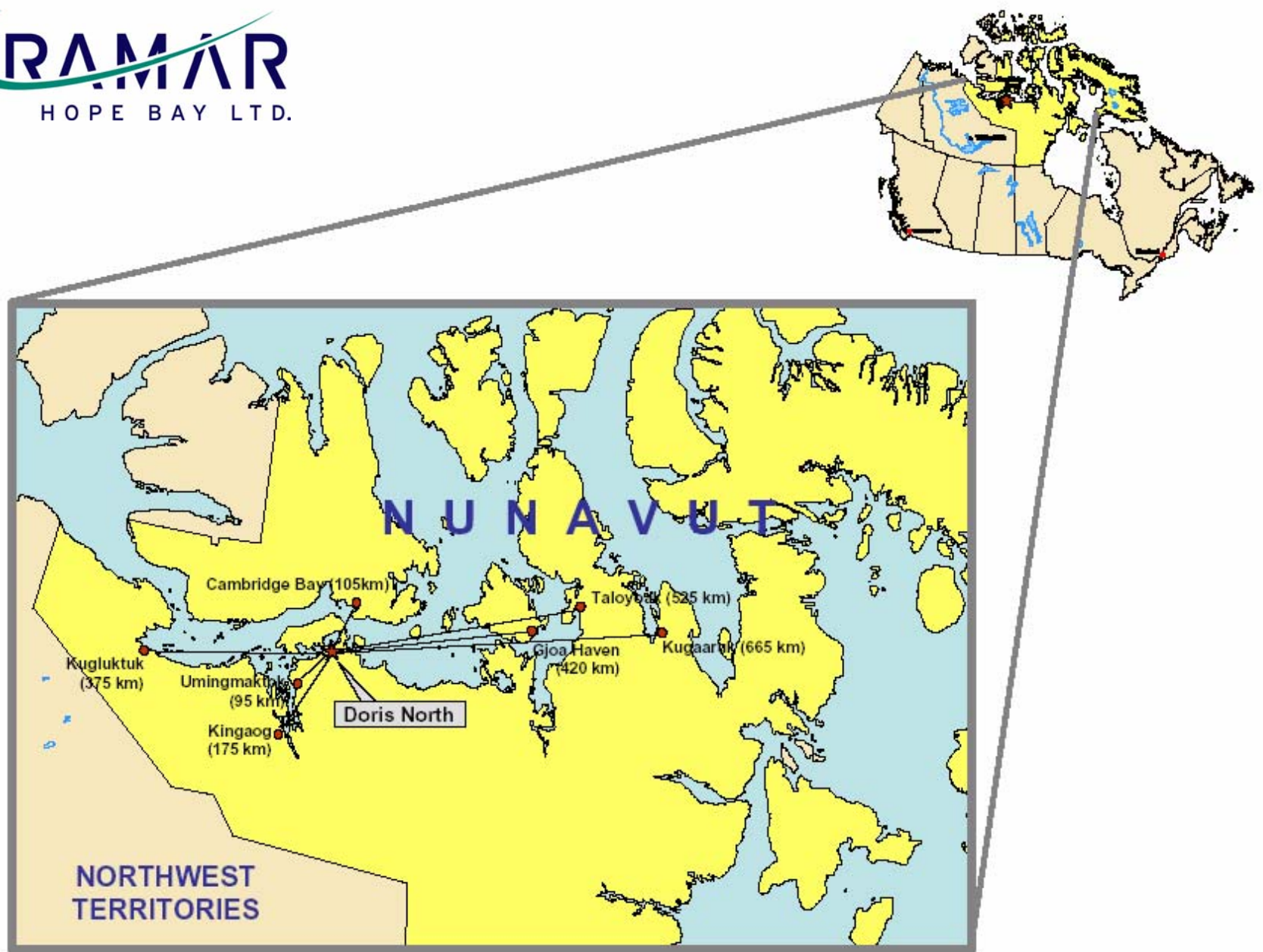
- ◆ **Jim Currie** Vice President of Operations
- ◆ **Larry Connell** General Manager, Environment
- ◆ **Terri Maloof** Manager of Permitting & Compliance
- ◆ **Alex Buchan** Manager of Community Relations
- ◆ **Katheryn McIvor** Tenure & Permitting Coordinator

# Introduction of the Miramar Team of Expert Consultants

- ◆ **Maritz Rykaart, Ph. D., P. Eng. - SRK Consulting Ltd.**  
Principal Geotechnical Engineer  
Tailings management, geotechnical engineering
- ◆ **John Chapman, M. Eng., P. Eng. - SRK Consulting Ltd.**  
Principal Engineer  
Water Quality modeling, geochemistry
- ◆ **Nathan Schmidt, Ph. D., P. Eng. - Golder Associates**  
Senior Water Resources Engineer  
Hydrology
- ◆ **Gary Ash, M. Sc., P. Biol. - Golder Associates**  
Principal & Senior Fisheries Biologist  
Water quality monitoring, wildlife monitoring, Fish No-Net-Loss Plan
- ◆ **Diana Valiela, Lawson Lundell LLP**  
Legal Counsel

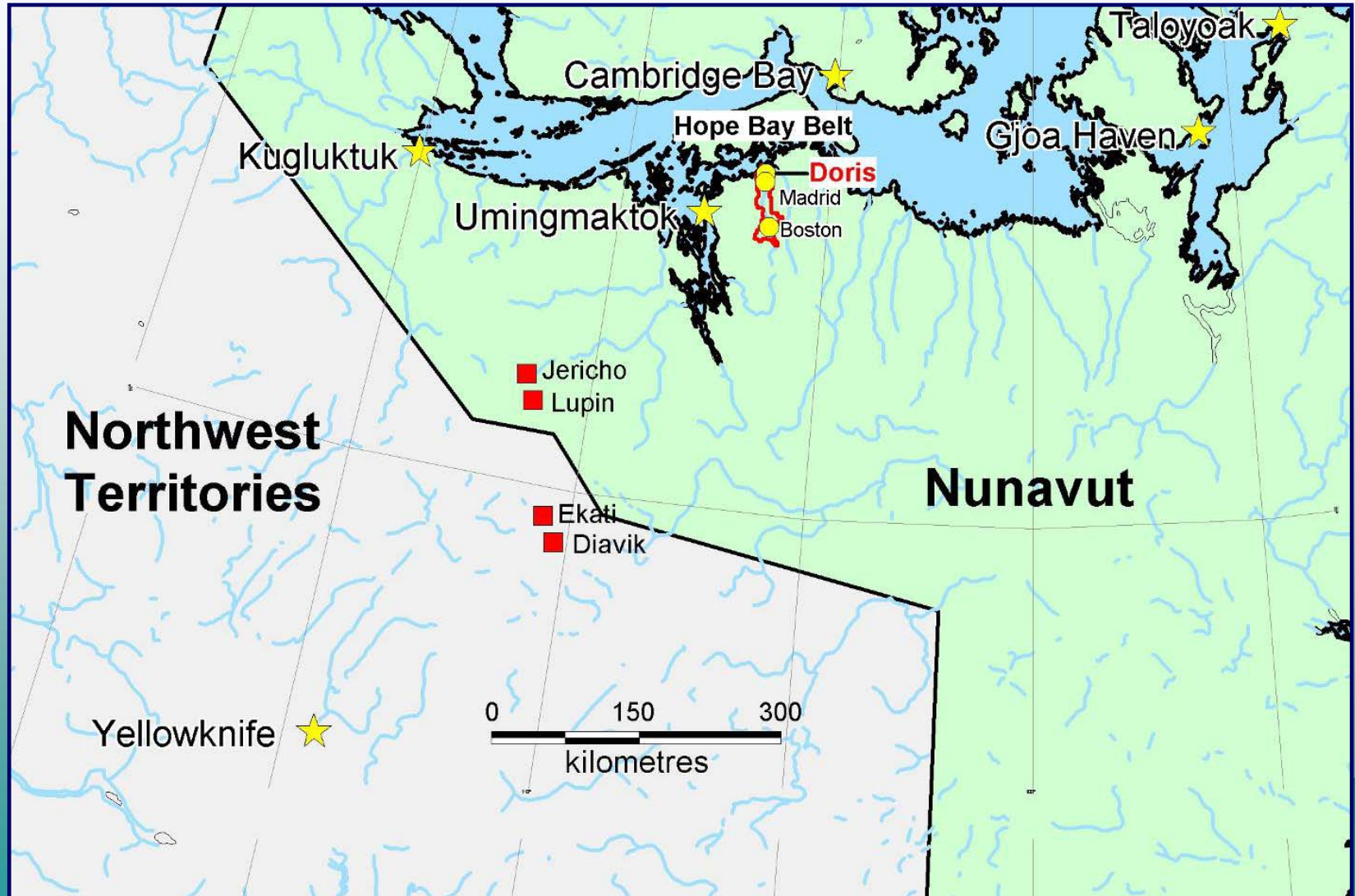
# Project Overview





Doris North Project Location

# Location of the Hope Bay Greenstone Belt





# Project Overview

- ◆ **Located on Inuit Owned Land**
- ◆ **Minerals owned by Nunavut Tunngavik Inc.**
- ◆ **Small underground gold mine - mining rate of 720 TPD of ore**
- ◆ **Expected to produce 311,000 ounces of gold from 460,000 tons of ore over 2 year mine life.**
- ◆ **Short term, profitable project in a large area with significant potential for long term profitable mineral production**
- ◆ **Site footprint will be approximately 54 hectares**

# Major Project Components

- ◆ **Underground mine accessed by a decline**
- ◆ **Mill to process the ore - design throughput of 800 TPD of ore)**
- ◆ **Power house (diesel generators) by mill**
- ◆ **Maintenance shop with warehousing**
- ◆ **Camp to house and feed workers**
- ◆ **Sewage Treatment Plant**

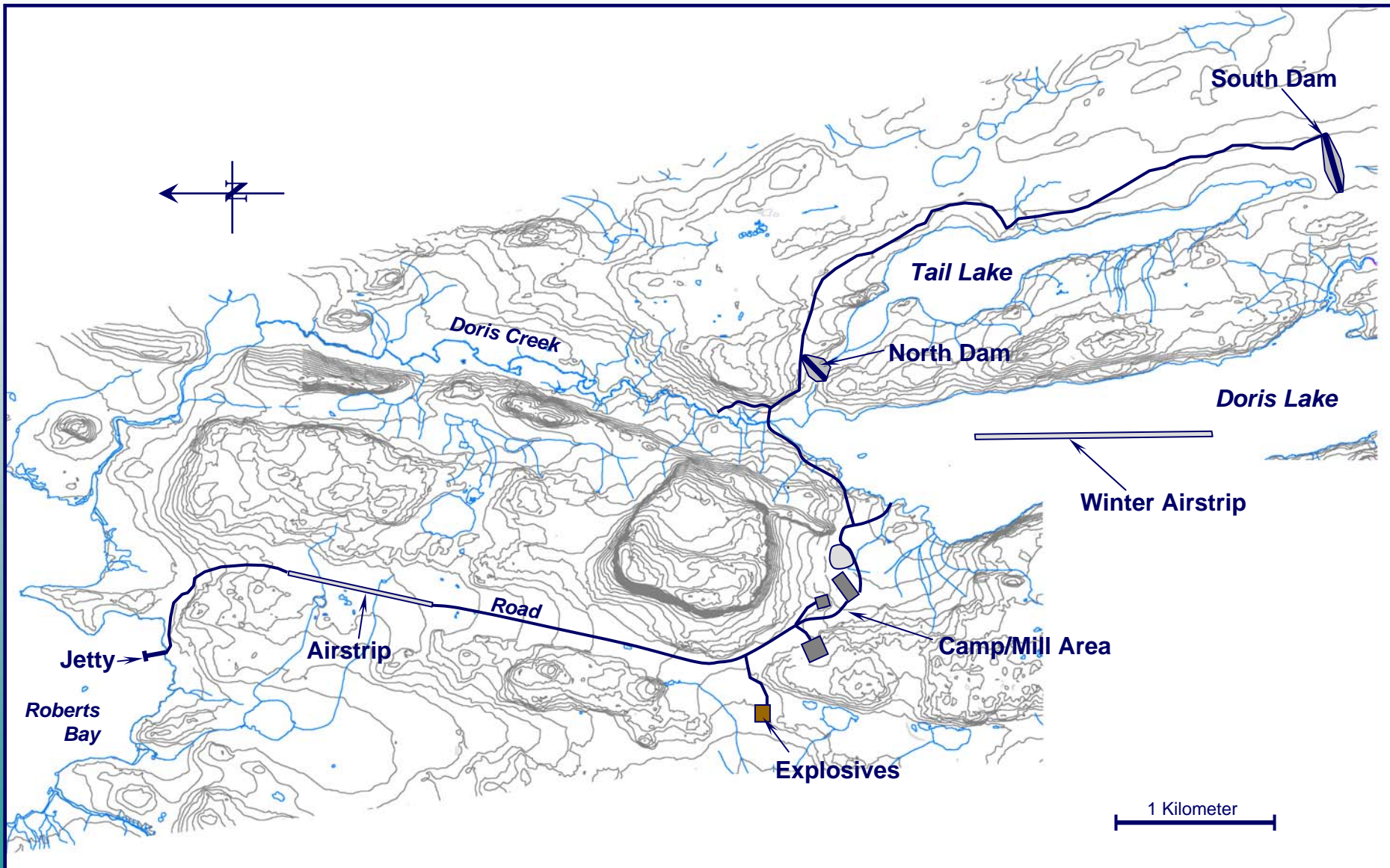
# Major Project Components

- ◆ **Fuel storage tank farm at the mill within a secondary containment (7.5 million litres)**
- ◆ **Fuel storage tank at Roberts Bay within a secondary containment constructed inside Quarry 1 (5.0 million litres)**
- ◆ **Tailings containment area and associated piping (Tail Lake located approximately 5 km from the mill)**
- ◆ **A non-hazardous landfill area to be constructed inside Quarry 2**
- ◆ **A landfarm facility to remediate petroleum contaminated soil to be constructed inside Quarry 2**

# Major Project Components

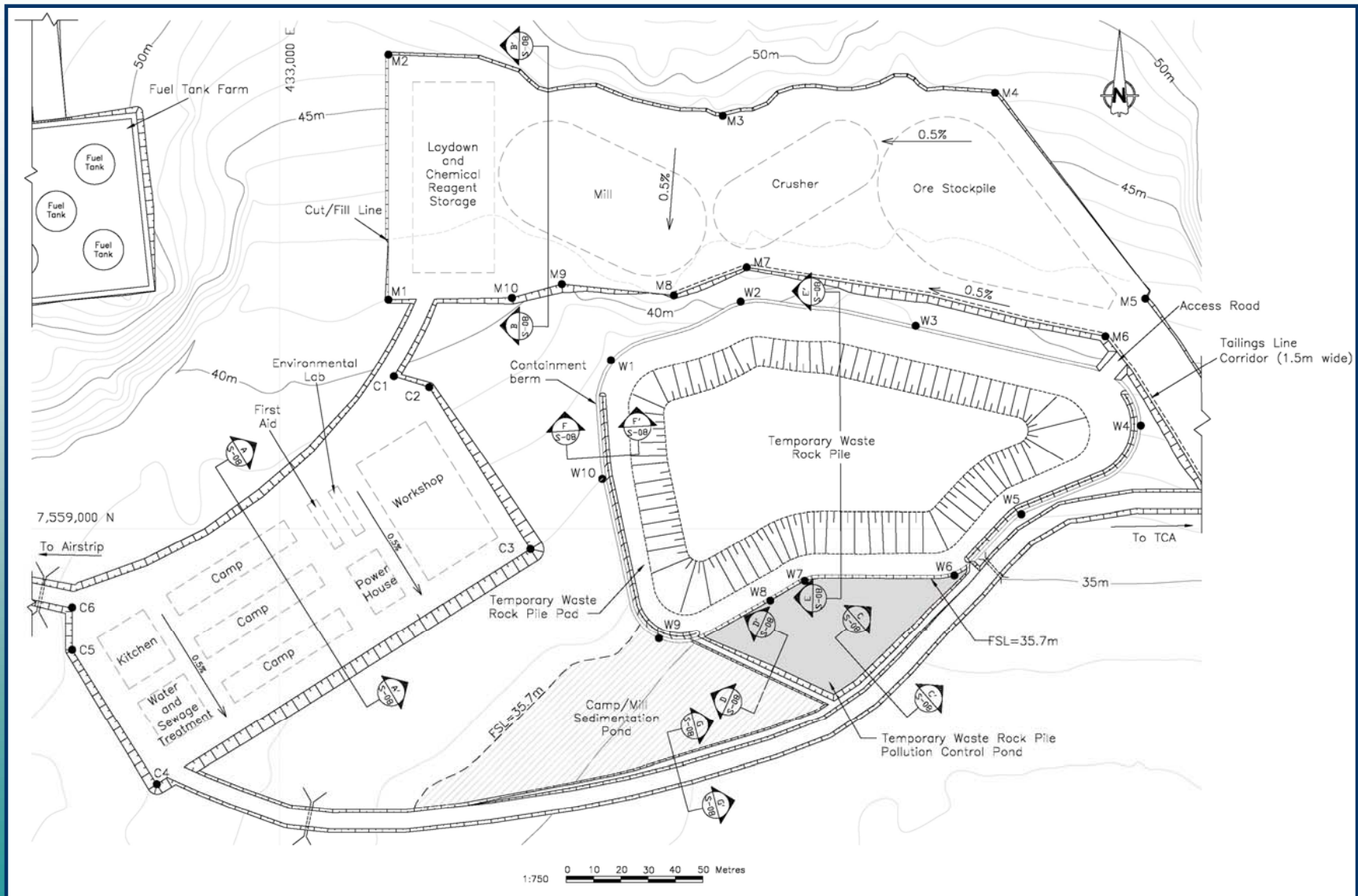
- ◆ **All-weather airstrip constructed as a widened section of the access road to Roberts Bay and a winter airstrip on Doris Lake**
- ◆ **Rock fill jetty in Roberts Bay to offload supplies shipped by barge to site**
- ◆ **Lay down area near the jetty at Roberts Bay**
- ◆ **4.8 km long access road between Roberts Bay and the mill site**
- ◆ **5.8 km long access road between the mill site and Tail Lake**

# Site Layout

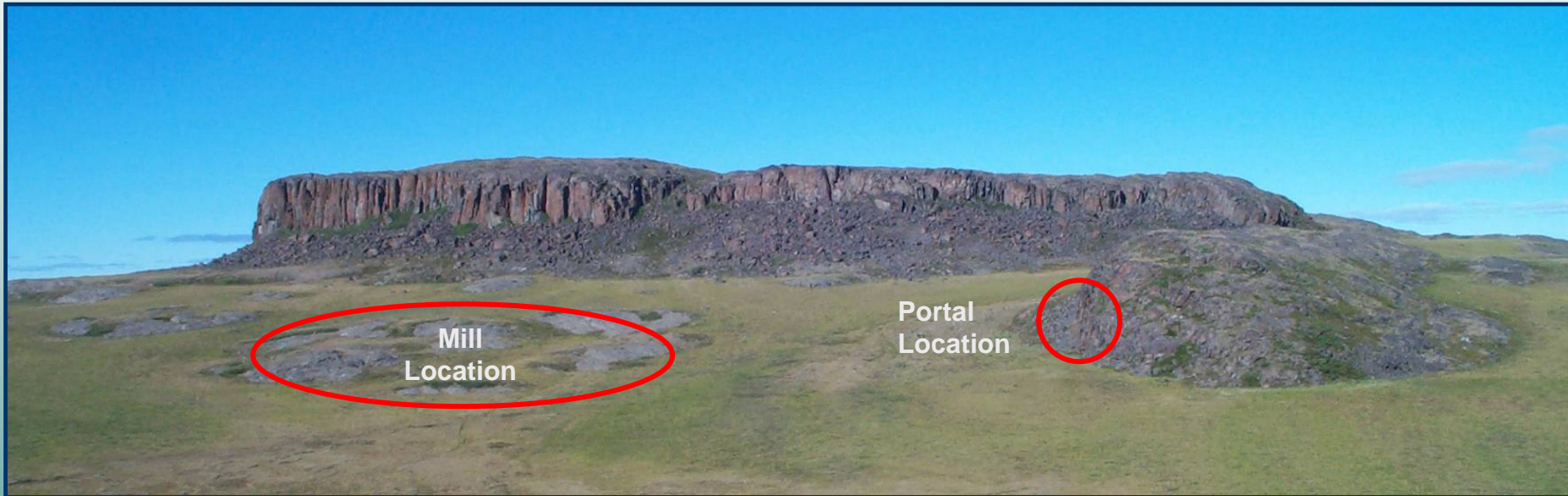




# Site Layout



# Mill/Camp Site



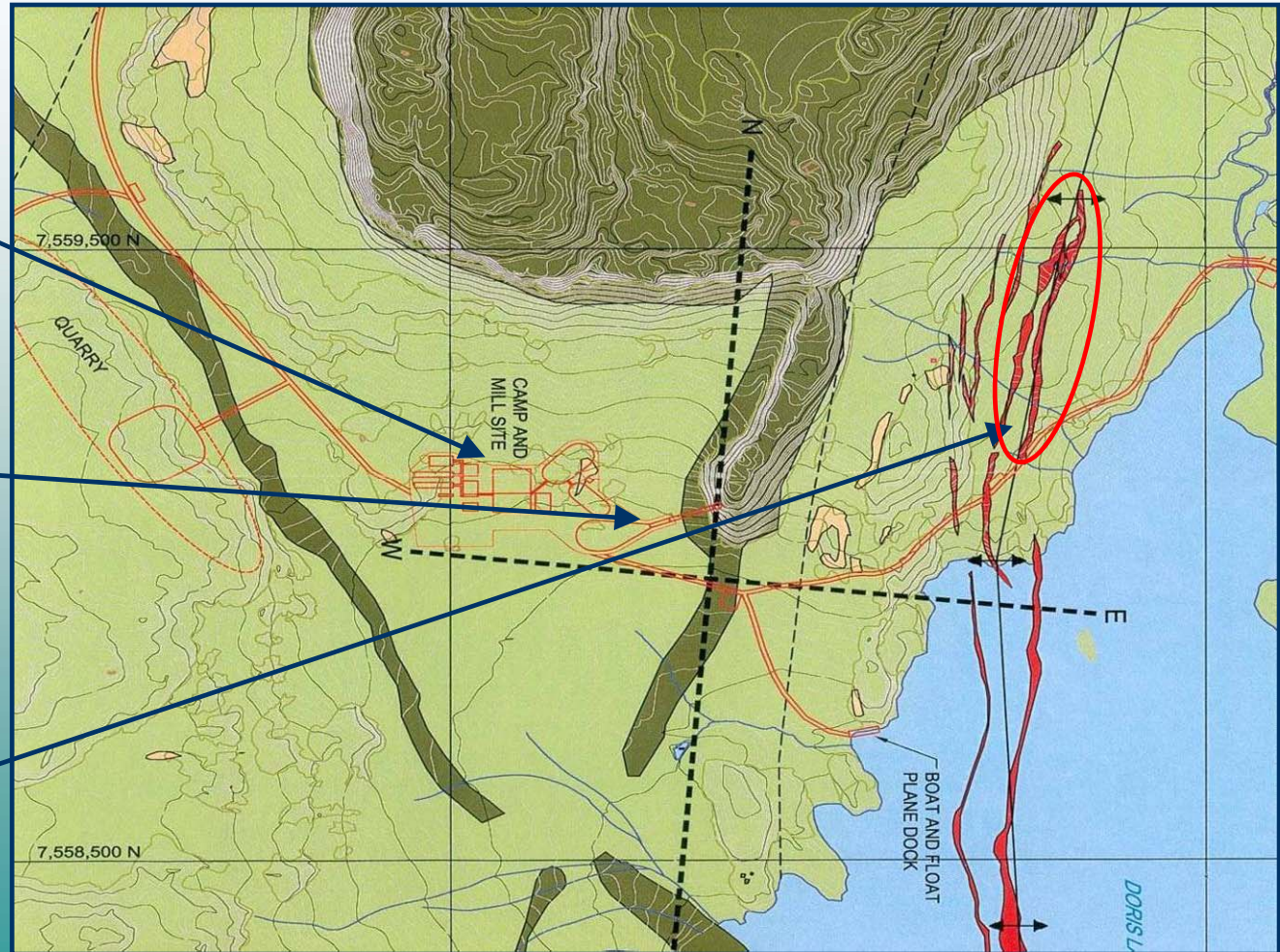


# Doris North Deposit in Relation to Doris Lake

**Camp/Mill Pad**

**Portal**

**Deposit lenses**



# How Will the Ore Be Mined?



- ◆ **Underground mine using open stoping & mechanized cut and fill methods**
- ◆ **Access by way of a ramp from surface, 4 m high by 5 m wide, 900 m long at 10% grade**
- ◆ **Lowest production level planned is 62.5 m below surface (2965 level)**
- ◆ **Ventilation by three vertical raises, one will provide secondary escape route**



# The Underground Mining Cycle

- ◆ Ore & waste rock are drilled off
- ◆ Drill holes are loaded with explosives and blasted
- ◆ Loose rock is scaled & rock bolts installed to secure roof
- ◆ Broken rock is loaded into underground haul trucks
- ◆ Ore is hauled to surface for milling
- ◆ Waste rock is hauled to other U/G locations as backfill or to surface for storage pending return to mine



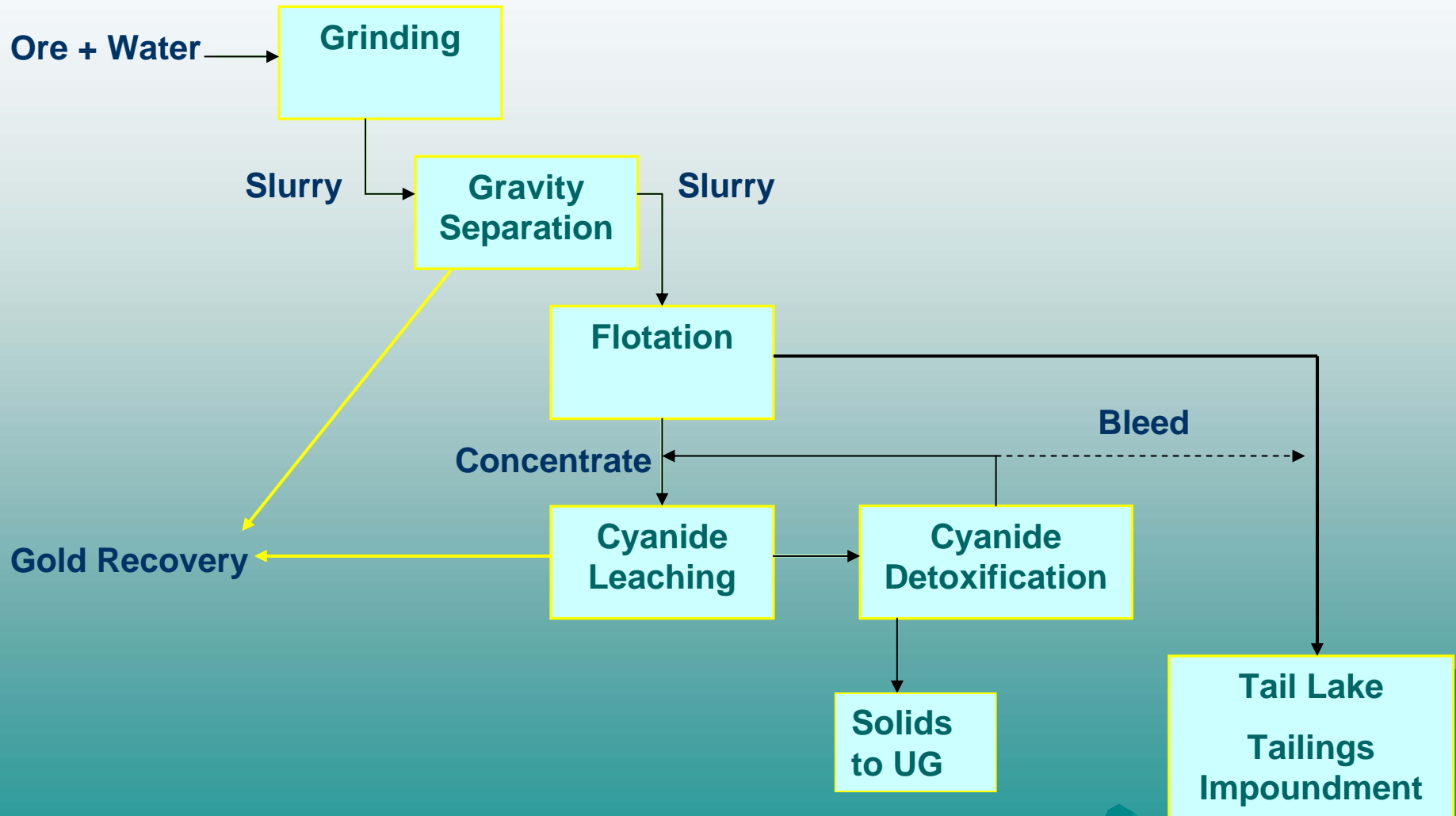


# Underground Mining



# **Ore Processing (Milling)**

# Ore Processing Cycle



# Ore Stockpiling & Crushing

- ◆ Ore is brought to surface by mine dump truck
- ◆ Placed into a stockpile located near crusher
- ◆ Picked up by front end loader and fed into the crusher
- ◆ Large rock is crushed into smaller rock and then placed on a crushed ore stockpile to be fed into the mill





# Ore Processing



- ◆ Ore is mixed with water and milled to break rock into a sand size (wet slurry)
- ◆ “Free” gold recovered using gravity circuit (jigs, gravity concentrators & tables). About 40% of the gold is recovered in the gravity circuit



# Mill - Grinding Circuit



# Gravity Gold Recovery



# Flotation/Leaching

- ◆ Remaining gold bearing minerals extracted by froth flotation
- ◆ 90% of the weight sent to tailings with no further chemical treatment
- ◆ Gold concentrated into 10% of the weight milled
- ◆ Only this concentrate is leached with cyanide to extract gold
- ◆ Leached gold is recovered on activated carbon
- ◆ Slurry from the leach circuit is treated to detoxify remaining cyanide and remove metals





# Milling - Flotation

