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CASE STUDY

NORTH MARA: DEWATERING AND PASTE PLANT SUCCESS STORY

BARRICK

2025

CUSTOMER BACKGROUND

Barrick Gold Corporation is a leading gold and copper producer with a global portfolio spanning the most prolific gold and copper districts. With a focus on high-margin, long-life assets, Barrick strives to deliver exceptional returns and benefits to all stakeholders. A cornerstone of their strategy is sustainable growth through long-term planning and continuous investment in world-class operations.

The North Mara gold mine, a flagship operation in north-west Tanzania, epitomises Barrick's commitment to excellence. Situated in the Tarime district, approximately 100 kilometers east of Lake Victoria, North Mara commenced production in 2002. The site features a combined open-pit and underground mining operation, with a process plant capable of processing 8,000 tonnes of ore per day.



PROJECT OVERVIEW

Challenges in Underground Operations

At North Mara, the Gokona Pit underground operations rely on longhole open stopping (LHOS) with backfill to extract ore. Historically, the mine utilised Cemented Aggregate Fill (CAF) as the backfill material, which was prepared using an on-site Aran plant and transported underground via dump trucks.

While critical to operations, the CAF system presented several operational challenges:

- Inefficiencies in transportation: High dependency on dump trucks created logistical constraints.
- Inconsistent backfill quality: Variability in CAF preparation hindered effective underground backfilling.
- Operational bottlenecks: Ineffective material flow risked compromising future mining plans.

To overcome these issues and safeguard long-term operational efficiency, North Mara required the implementation of a state-of-the-art paste fill system to replace the existing CAF system.

THE SOLUTION

Advanced Paste Fill System Implementation

In 2020, Paterson & Cooke (P&C) completed a feasibility study for a new paste fill system at the Gokona Pit.

The study covered:

- Design: Development of surface plants and an underground distribution system (UDS).
- Cost Analysis: Preparation of comprehensive capital (CAPEX) and operational (OPEX) expenditure estimates.
- Implementation Strategy: A roadmap for transitioning from CAF to the paste fill system.

Following the study, Twiga Minerals Corporation Limited, a joint venture between Barrick and the Government of Tanzania, appointed P&C to deliver the project.

Key responsibilities included:

- Detailed engineering design.
- Construction and commissioning assistance.
- Backfill operator training to ensure seamless integration.

KEY TECHNICAL COMPONENTS

- Control Systems
  - 2 x Rockwell PLCs with 800 IO points and 10 remote IO (RIO) panels.
  - Control of 140 drives.
- SCADA System
  - Plants SCADA 2018 with redundant servers and 2 client workstations per site.
- Network Infrastructure
  - Cisco switch-based ring network connecting RIO panels and motor control centers (MCC).
- Servers
  - Client-supplied virtual servers for efficient data management.



RESULTS AND BENEFITS FOR BARRICK

The implementation of the paste fill system delivered transformative outcomes for North Mara's Gokona operations

1. Improved Operational Efficiency
    - The new system streamlined underground material flow, reducing bottlenecks and improving overall productivity.
2. Enhanced Backfill Quality
    - Consistent paste fill preparation ensured reliable underground support, critical for maintaining mining stability and safety.
3. Cost Optimisation
    - Reduced dependency on transportation equipment minimised operational costs and increased system reliability.
4. Future-Proofed Operations
    - The solution safeguarded long-term mining plans, ensuring sustainable production in line with Barrick's strategic goals.
5. Knowledge Transfer
    - Training programs equipped on-site operators with the skills needed to maintain and operate the advanced system, building local expertise.



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The company's mission is to empower our partners to future proof their businesses through Digital AI Transformation to make better and more informed decisions in the modern digital economy.

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