Extending the life of a copper tailings facility

Case Study

At a glance

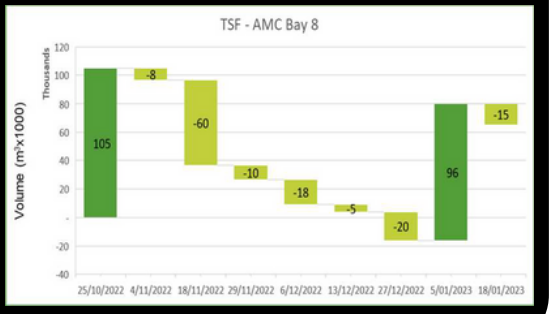
Phibion's Acclerated Mechanical Consolidation (AMC™) in-situ dewatering process using MudMaster® technology harnesses tailings properties resulting in large water recovery rate, reduced tailings volume, and releases trapped water. This results in reduced operational footprint, storage requirements and capital expenditure. Phibion delivers tailings dewatering at a fraction of the cost of other alternatives today, without compromising the future.

Results

415 DAYS
added to to useful life of asset

70%
water recovery rate

23%
increase in dry density



CHALLENGE

It is a global reality that copper grades in mining operations are reducing, and tailings volumes are increasing.

Community awareness has driven mining companies to demonstrate their environmental leadership and responsible management to minimise operational footprints, maximise water return, and reduce operational cost.

In a typical scenario, a mining operator faces various challenges when managing tailings facilities due to increased dam wall raises and rapid volume exhaustion, reducing life of asset and increasing capital spend requirements. Issues are primarily driven by:

• Uncontrolled tailings placement and deposition depth constraining unpredictable processes of natural consolidation and solar drying process.

• Poor water recovery due to defective deposition system reducing effective storage and available deposition area.

• Deposition plan leading to a significant water cumulation (water losses) reducing water recovery at the decant and shortening dam storage life for tailings placement.

SOLUTION

Phibion in conjunction with the mining operator developed and implemented an AMC™ operations plan using a fleet of MudMasters® working on saturated tailings material accelerating the transition from slurry to solid. The process aimed to:

- Reduce water trapped in tailings layers improving the density of tailings through repeated passes with the MudMaster® liberating storage for additional waste material.
- Enhance water recovery, drainage and slope beach angle that convey water directly towards decant.
- Strengthen material shear and residual strength.

Phibion's solution and AMC™ plan comprised of:

- Operational area of 90Ha, divided in AMC™ bays of 22.5 Ha each
- MudMaster® fleet of 2 machines
- Work shift roster pattern 5/2, with 6.5 hours of scroll time
- Continuous surveillance and monitoring of aerial survey and analysis of fill/cut rates of working area with additional insitu manual vane shear testing.

BENEFITS

1. MudMaster® combined with a detailed AMC™ plan dewaters tailings at a high rate reducing volume occupied by slurry, increasing material density and shear strength.
2. Effective in-situ tailings dewatering returning water back to decant and mine water system.
3. AMC™ delivers order of magnitude faster tailings consolidation and it is highly predictable when compared with other management practices.
4. AMC™ returns storage within existing facility so additional tailings can be placed, extending life of the facility, reducing or deferring capital construction budget.

Phibion delivers:

Tailings Management Technology and Services
- Advanced in-situ mechanical dewatering technology
- Making tailings dams safer, smaller and sustainable – real results in realtime

Accelerated Mechanical Consolidation (AMC) dewatering technology
- Reduce tailings volume & footprint by up to 50%
- Recover water by 40%
- Density increase by 20%
- Increase strength up to 35kPa

Global reach with offices in Australia, Jamaica, Chile and Brazil
- Fabrication facility in Brisbane, Australia

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PHIBION®
Intelligent tailings management