

# Performance Study

Ref. No.: 22-001K



**3% w/w**  
Increase in  
underflow density



**14%**  
Reduction in  
water to tailings



**5.1m m<sup>3</sup>**  
Reduction in water  
to tailings per year



**\$18m**  
Reduction in value of  
water to tailings (USD)



**15%**  
Reduction  
in flocculant

Commodity  
**Copper and Molybdenum**

Technology  
**Advanced Process  
Control System**

Application  
**Tailings Thickeners**

Study type  
**Customer Story**

Country  
**Chile**

## Achieving over 5 million m<sup>3</sup> reduction in water to tailings at a Chilean copper-moly mine

Implementation of an advanced process control system on the tailings thickeners of a Chilean copper-molybdenum mine resulted in a 14% reduction in water going to tailings. This equates to 5.1 million m<sup>3</sup>/year of water, at an estimated cost of USD 18 million, that could otherwise have been sent to tailings. The system also decreased flocculant consumption by 15% and improved thickener stability and reliability.

Located 1700 m above sea level, the mine is located in an area where water is a scarce commodity. So scarce that the mine relies on seawater supplied from the water-cooling system of a coastal thermoelectric power plant. The seawater is pumped through a 143 km pipeline into a seawater pond at the mine.

This is an expensive undertaking – and likely to become more so. Estimates indicate that OPEX associated with utilising seawater in Chile's mining industry will be USD 135-275 per metric tonne of payable metal, depending

on altitude, by 2028. These factors led the mine to implement an advanced process control system to stabilise and increase water recovery from the tailings thickeners. Continuous optimisation of thickener performance also increases underflow density, reduces flocculant consumption, and improves water quality. When integrated with intelligent process dynamic simulation, it allows remote monitoring and condition prediction, so targets can be adapted to real-time conditions to improve controller performance and alert operators to current situations.

### As a result of the upgrade, the mine achieved:

- 14% reduction in water to tailings at a potential saving of USD 18 million per year<sup>1</sup>
- 15% decrease in flocculant consumption at an OPEX saving of USD 350,000 per year<sup>2</sup>
- 3% solids (w/w) increase in underflow density

Ultimately, this lowers the amount of water lost to seepage and evaporation and thus improves water sustainability in one of the most water-stressed mining regions. It also reduces pumping costs and associated energy consumption – another environmental win.

1. Based on average water cost of USD 3.50/m<sup>3</sup>.
2. Based on flocculant cost of USD 4.00/kg.

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