

Commodity
Copper

Technology
Spiral Rake Blade System

Application
Paste Thickener Upgrade

Study type
Customer Story

Country
Kazakhstan

How we increased tailings dam stability and water recovery at a large copper mine in Kazakhstan

A large copper mine in Kazakhstan increased tailings underflow densities by 11% following installation of our patented spiral rake blade systems. The upgrade not only resulted in a 26% reduction in water to the tailings facility; it also helped improve tailings dam stability and reduced the frequency of dam lifts.

Before the upgrade, the mine's existing thickeners averaged underflow densities of just 61% solids (w/w). This provided insufficient viscosity to achieve the desired beach slope; tailings water and solids were also segregating to form flow channels. The result was a tailings pond that was not in the original design and that required additional pumping to recycle the water back to the plant. It also led to the need for an earlier-than-planned raising of the tailings dam.

The copper miner approached us to supply paste thickeners that would deliver underflow densities in excess of 68% solids (w/w).

Based on existing R&D work that was looking at ways to improve underflow density, we were able to accelerate development of our spiral rake paste thickener design to deliver three, first-of-a-kind systems to the mine.

After start-up of the paste thickeners, underflow densities of between 68% and 72% solids (w/w) were achieved, the first time a plant of this scale has achieved this level of dewatering. This not only recovers more water and reduced the volume of the tailings by 17%; it also provides sufficient viscosity to form the desired beach slope. The need for tailings dam lifts is therefore reduced, and the stability of the dam is improved.

Eliminating short-circuiting also helps avoid ratholing, donut formation, and torque spikes (with their concurrent spike in energy demand). The overall result is a tailings facility that is safer, easier, and more economical to operate and control, while also consuming less energy.



26%
Reduction in
tailings water



17%
Reduction in
tailings volume



11%
Increase in
underflow density

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