Case study

M 01-24 4000-2-ENG V2

Thickener upgrade worth its weight in gold

With productivity and performance hampered by their leach feed thickener, one of Australia's largest open-pit gold mines asked FLS to investigate. The solution FLS delivered continues to pay dividends.

"Having control of the project meant we could keep to the required tight delivery schedule, while remaining on top of quality and planning on site"

Dane Smith
PRODUCT MANAGER, DEWATERING

Background and objective

One of Australia's largest open-pit gold mines was dealing with a productivity and performance issue. Their leach feed thickener was creating a bottleneck in their processing plant. The thickener – which was neither supplied nor installed by FLS — was an off-the- shelf design. It was not optimised for the plant or the processing requirements, and was hindering the gold mine's success.
As the on-site maintenance contractor, we were asked to assess the problem and offer a solution.
The objective: to improve overall plant performance.

Defining the project

Our team of specialists initiated a range of test work, a process review and structural analysis of the bridge and thickener tank. It was established that the existing feed system was undersized and hampered by air entrainment. The density-reliant dilution system meant that the feed stream was not being diluted, resulting in high flocculant consumption, poor overflow quality and lower than desired underflow density.

FLS engineers recommended the mine install a proven combination of our E-DUC® dilution technology and E-Volute™ feedwell.

FLS

The solution

We combined E-DUC and E-Volute solution directly targeted the thickener's underperformance characteristics of low flocculant efficiency and feed distribution.

The E-DUC system uses feed stream momentum to dilute incoming feed prior to the feedwell, optimising flocculant consumption through improved mixing profiles and residence time.

The E-Volute feedwell provides excellent feed stream energy dissipation, optimal mixing energy and shear profiles, resulting in maximum floccule growth and even feed distribution into the thickener tank.

The results

Initial analysis revealed the installation of FLS E-DUC system and E-Volute feedwell reduced flocculant consumption by 34%. It improved overall performance of the thickener, which now achieves consistent production of up to 1000 tph (original nameplate design of 700 tph). The production bottleneck at the thickener has also been eliminated.

With the FLS technology installed and the process control system optimised under FLS supervision, the leach feed thickener now controls to a set point of 54%w/w at a flux rate of 1.1 t/m2.hr.

This density is comparable to that achieved out of the competitor tailings thickener operating at 0.66 t/m2.hr highlighting the remarkable improvement in performance after the modifications as well as the need for bespoke design capabilities.

In a package that is unique to FLS, the complete service on this project included design, engineering, fabrication (including the new feed system), planning, scheduling, project management, installation and commissioning. We were able to complete the project ahead of schedule. In fact, the planned shutdown period for installation was reduced by three shifts.

The mine has achieved return on investment on the new system in less than six months. ithout any specialised tools or training.

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