



Case Study
Mining Industry

Defoamer project at concentrate thickener



Problem Statement

The client was struggling with foam at the concentrate thickener.

Solution

Watericon trialed a project to find the optimal dosage of defoamer at different parameters for the tough adherent foam at the thickener.

The fine particle size, combined with foaming induced by process reagents and dissolved air in recycled high-pressure filtration water, means that a defoamer alone may not adequately control foam formation.

The objective of this project was to:

- 1. Use defoamer to achieve complete foam knock-down or collapse
- 2. Use spray water to improve defoamer dispersion over the entire surface of the concentrate thickener
- 3. Use lime to improve settling rate of finer particles to achieve the desirable thickener overflow water clarity
- 4. Assess the cost implication of adding lime to the thickener to improve clarity.

CUSTOMER IMPACT

1.25T per month of Nickel concentrate losses eliminated from thickener overflow.
LME Ni \$20,500/ton
Floc saving =\$2300
Defoamer spend = \$5000/month
Lime spend = \$752/month

Floc saving 14g/t= 0.65tons/month
Additional Lime 92g/t= 4.3tons/month
Defoamer 30g/t= 1.4tons/month



ECONOMIC RESULTS

\$27,000 additional revenue per month and \$324,000 per annum.
ROI = \$324,000/yr
Investment Multiplier = \$4.7 for every \$1 spent



Results

Based on the measured suspended solids, there was a 90% relative overall improvement in thickener overflow clarity during the period on defoamer and lime.

Average O/F TSS was measured at 490mg/L for the OFF period and 50mg/L during the defoamer ON period.

- The defoamer achieved a complete foam knock-down at 50g/t based on the milled tonnage.
- The spray water improved the defoamer dispersion across the surface of the thickener.
- Lime acted as a coagulant and improved the settling rate of finer particles.
- The addition of lime reduced the flocculant consumption.

This led to: 1.25T per month of nickel concentrate losses ELIMINATED, leading to \$27,000 additional revenue per month after costs. ROI = \$324,000/yr.

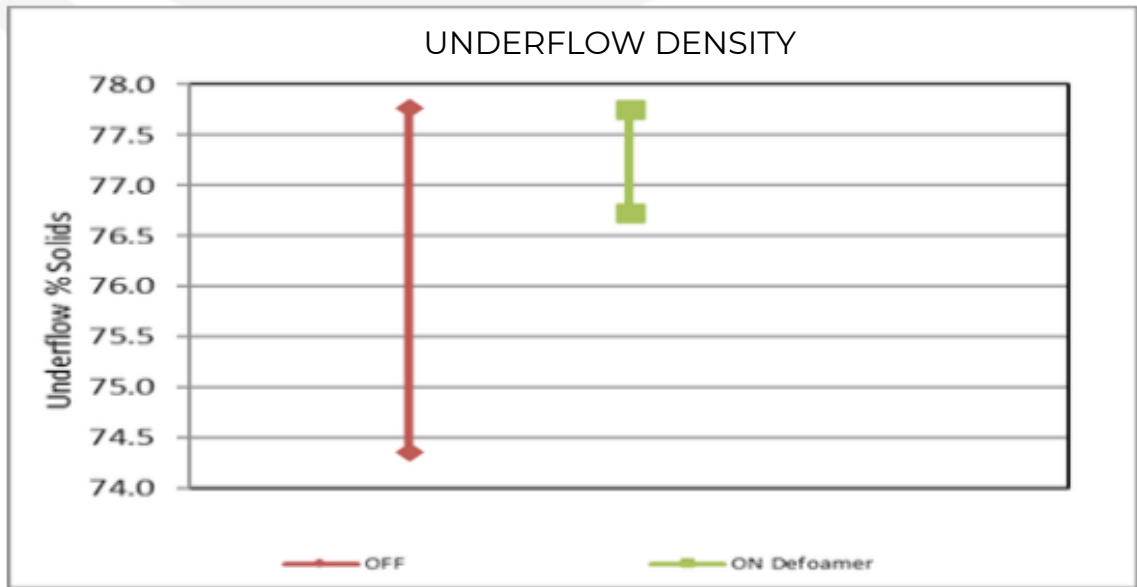


Figure 8. Significance of density variance

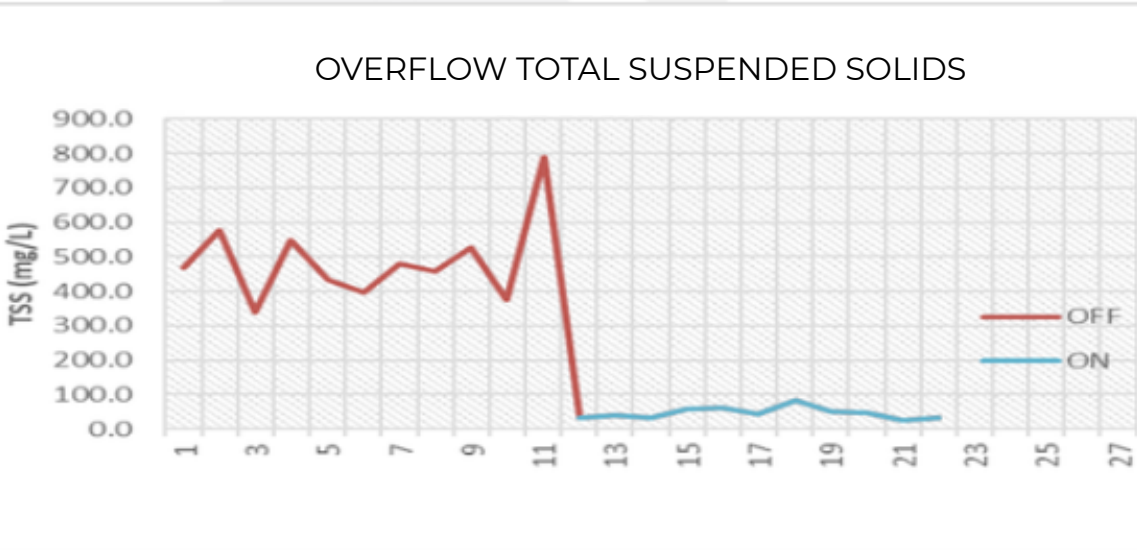


Figure5. Total suspended solids trend

