



## STREAMWISE Technology for DAF Saves Australian Dairy Producer \$268,042

### BACKGROUND

Dairy processing is a water intensive operation. For every liter of milk produced, up to 2 liters of wastewater are generated containing high levels of total suspended solids and organics. Wastewater treatment can have a significant impact on a processor's total cost of operations from the cost of chemicals, trade waste charges, sludge disposal costs and labor requirements. With increasing competitive pressure and tightening environmental regulations, dairy processors are looking for innovative ways to improve their wastewater treatment performance and lower their overall operating costs.

**STREAMWISE technology for DAF is helping an Australian dairy processor significantly lower its waste treatment operating costs through:**

1. Reduced chemical consumption
2. Decreased trade waste charges
3. Lower operator oversight

### OPPORTUNITIES

An Australian dairy production facility making butter, lactose, powder and anhydrous milk (AMF) processes on average 1,000,000 liters of raw milk per day and generates up to 1,000 kiloliters per day of wastewater. The wastewater is processed through a Dissolved Air Flotation (DAF) system to reduce TSS and organics prior to being discharged to the local sewage treatment plant. In addition to the plant wastewater stream, the AMF process generates a product residue stream that had to be trucked off site and disposed of at significant cost to the plant.

The Dairy Processor was facing increased pressure from the local water authorities to reduce the quantity of water generated as well as the level of contaminants in the waste stream. In addition, a pending rate increase would result in a significant increase in the plant's trade waste charges. Given these pressures, the plant began to actively investigate ways to improve their wastewater treatment operations including opportunities for water reuse/recycle.

Waterwerx was consulted on the use of its STREAMWISE Technology for DAF to help the plant:

1. Improve DAF contaminant removal efficiency and consistency to:
  - a. Discharge cleaner water to the local water authority resulting in lower monthly trade waste charges.
  - b. Reduce the AMF Product Residue disposal cost by processing through the DAF.
  - c. Evaluate the use of DAF effluent as input water for further reuse, recycle opportunities within the plant to minimise both trade waste and fresh water charges.
2. Minimise DAF operating costs by:
  - a. Optimizing waste treatment chemical requirements.
  - b. Reducing trade waste charges.
  - c. Eliminating discharge exceedance fines.
  - d. Minimising the need for DAF operator oversight.

# WASTEWATER IN DAIRY PROCESSING: A CASE STUDY

## STREAMWISE SOLUTION

Waterwerx's Streamwise technology continually optimises DAF operations, automatically responding to variations in feedwater quality and quantity. Reliable online sensors monitor DAF inlet and outlet water quality every 3 seconds, proprietary AI driven control algorithms optimise system performance in real-time and cloud-based analytics provides continuous improvement insights. This comprehensive IoT approach to DAF operations ensures the best performance at the lowest cost.

## STREAMWISE RESULTS

Table 1 shows the improvement in DAF operation from existing to STREAMWISE control with 35% improvement in TSS and 43% FOG in the effluent translating to 42% lower BOD.

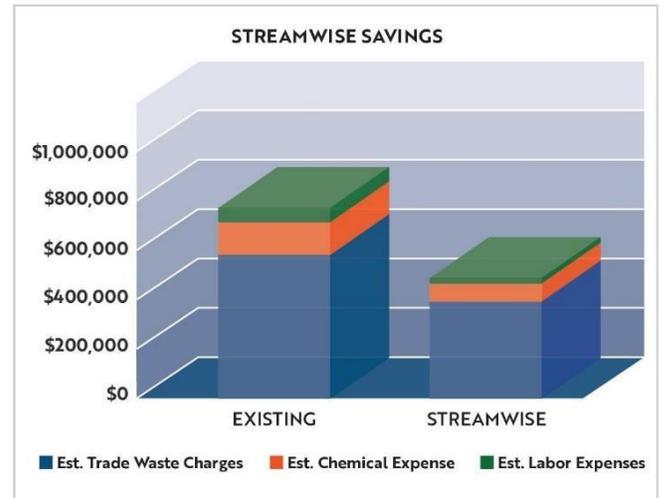
DAF PERFORMANCE (DISCHARGE)			
	EXISTING	STREAMWISE	IMPROVEMENT TSS
TSS (mg/l)	1,336	868	35%
BOD (mg/l)	574	331	42%
TKN (mg/l)	74	56	25%
FOG (mg/l)	54	31	43%

Table 1: DAF Performance – Existing vs STREAMWISE

Table 2 shows the impact that maintaining lower TSS, BOD and FOG in the effluent has on the cost of operation, lowering trade waste charges by 26%. The continuous online chemical optimisation means that the improved DAF performance could be achieved while using 31% less treatment chemicals and requiring a significant 80% reduction in operator oversight. In total, the STREAMWISE system will save this dairy processor over \$268,000 per year.

ANNUALISED TCO SAVINGS			
	EXISTING 284,000	STREAMWISE 284,000	SAVINGS Est.
Annual Wastewater Volume (kL)			-
Est. Trade Waste Charges	\$700,907	\$515,970	\$184,937
Est. Chemical Expense	\$137,351	\$94,245	\$43,106
Est. Labor Expense	\$50,000	\$10,000	\$40,000
TOTALS	\$888,258	\$620,215	\$268,043

Table 2: Total Cost of Operation – Existing vs STREAMWISE



Additionally, the plant ran a successful trial processing the AMF residue stream through the DAF that will result in reduction of disposal charges.

STREAMWISE's ability to provide consistent, high quality effluent water has resulted in plans for the plant to trial recycling technologies.

## CONCLUSION

STREAMWISE for DAF technology is helping this Dairy processing plant discharge cleaner wastewater to the local water treatment authority, while using less chemicals and lower operator oversight resulting in a significant reduction in their total cost of operation. In addition, more efficient and consistent DAF operations will support future water reuse and recycling efforts.