

Water recycling reduces dairy water footprint, UK

Food & Beverage | Case Study

The Client

From small beginnings in 1947 in East Kilbride, Scotland, Robert Wiseman is now one of the UK's largest dairy operations, supplying around 30% of all the milk consumed in the UK.

Its flagship Bridgwater dairy processes one and a quarter million litres of milk every day. It is one of the UK's most advanced dairies producing 400m³/day of process wastewater, which is treated and discharged to the local Rhyne.

Robert Wiseman is committed to reducing its environmental impact and, in particular, its water footprint. It has set an in-house target of reducing water use across its network of dairies by 25% by 2015.

Key Figures

- Robert Wiseman Dairies produce 400m³/day of process wastewater, which is treated and discharged to the river Rhyne.
- The average UK dairy uses 1.3 litres of water for every litre of milk processed.
- Water Footprint reduction target of 25%

The Client's Needs

One of the major costs in milk processing is water. According to Envirowise, the average UK dairy uses 1.3 litres of water for every litre of milk processed, mostly for steam raising and cleaning in place (CIP).



The dairy's process wastewater is treated by dissolved air flotation (DAF) followed by a membrane bioreactor (MBR) to produce a crystal clear effluent that more than meets the discharge consent to the Rhyne and provides substantial savings compared with sewer discharge.

However, the effluent is of such good quality it offered the opportunity of recycling, and Robert Wiseman contacted Veolia Water Technologies to develop a suitable solution.

The Solution

Pilot plant trials confirmed that the MBR effluent could be fed directly to a reverse osmosis system. Veolia Water Technologies installed a MegaRO™ system to recover 200m³/day of the process wastewater to replace mains water in the CIP system. This was the first time reverse osmosis technology had been used for water recycling in the UK's dairy industry.



Process Description

Pilot plant trials confirmed that the MBR effluent could be fed directly to an Veolia Water Technologies MegaRO™ system, so the dairy industry's first reverse osmosis recycle system was installed to recover 200m³/day of the process wastewater to replace mains water in the CIP system.

Veolia Water Technologies's MegaRO™ reverse osmosis technology uses a membrane to remove 99% of residual COD, dissolved salts and bacteria from the treated process wastewater, producing water of equal or better quality, than the mains supply. The MegaRO™'s low pressure membranes and high efficiency pumps make it one of the most energy efficient plants on the market. Low energy use means not only reduced carbon emissions but also low operating costs.

The MegaRO™ runs continuously and the permeate is chlorinated and stored for use in CIP. The quality of the waste concentrate stream is still good enough for discharge direct to the Rhyne.



MegaRO™

The Benefits

The operating cost of the MegaRO™ is low; the recovered water actually costs less than mains water even after including capital amortisation. The net savings on the reduction in mains water consumption means that the new plant will give a payback in only two and half years.

Having seen the environmental and economic benefits of recycling process wastewater, Robert Wiseman Dairies are planning to install combined effluent treatment and recycling systems at some of their other dairies where process wastewater is currently discharged direct to sewer.

Results

- The dairy industry's first reverse osmosis recycle system was installed to recover 200m³/day of the process wastewater to replace mains water in the CIP system.
- Return on investment achieved in approximately 2 ½ years



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