

MONASH INDUSTRY TEAM INITIATIVE (MITI)

WATER SAVINGS AT FONTERRA DARNUM SITE

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BACKGROUND

Fonterra has established long term global sustainability targets to reduce water consumption, greenhouse gas emissions and waste to landfill. This includes a commitment to reduce water consumption at water-scarce sites by 30% by 2030 and improve water efficiency at all sites. The Fonterra Darnum site operates a paediatric nutritional powder facility and relies on supply from Gippsland Water. The site is motivated to better understand water consumption and contribute towards achieving the sustainability targets. Reducing total site water usage at Darnum would also result in decreased operational costs and reduced load on the site's wastewater treatment and storage capacity. The goals of this project were to: conduct a sitewide water balance, validate a shortlist of water savings options and research new areas for savings.

WATER MAPPING

A site water balance was conducted in order to improve understanding of typical water usage and establish a model for ongoing usage monitoring, which will facilitate development of future water savings initiatives.

Key tasks and methods included:

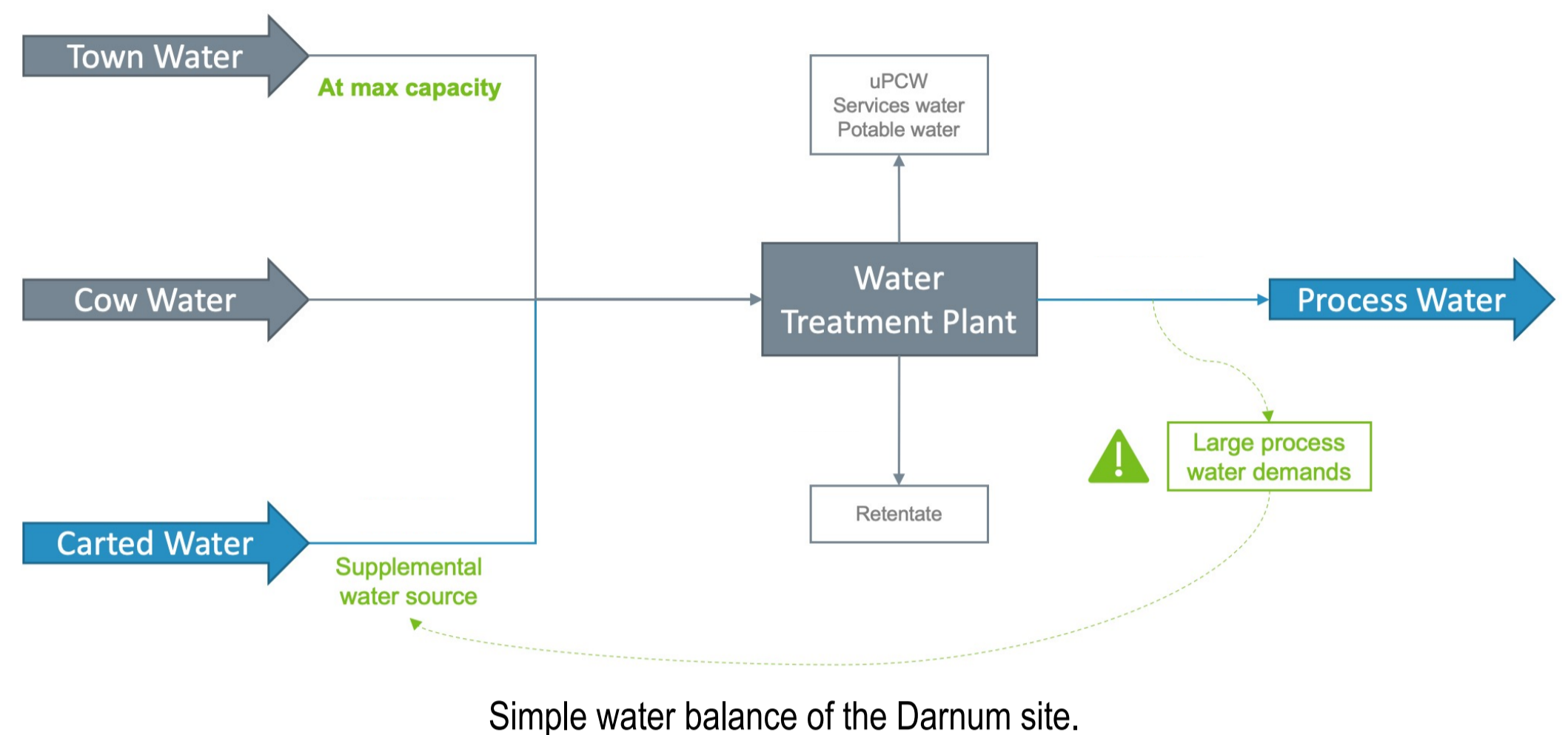
- Use of an ultrasonic portable liquid flowmeter
- Calculations with data collected from the site's supervisory control and data acquisition (SCADA) systems
- Tracking of water usage invoices to determine typical incoming volumes

The results of the water mapping investigation included:

- A site water map in the form of a block flow diagram with water volumes for each route over a typical week
- Recommendations of areas for additional flowmeter installations and methods to quantify water usage for clean-in-place (CIP) washes



Above: Having a catch-up together.
Left: Out the front of the Darnum site.



WATER SAVINGS VALIDATION

Water savings options included:

- Installing a new heat exchanger
- Installing new rinse recovery tanks
- Optimising automation to use less water

Key objectives:

- Validate (quantify and model) water savings options
- Find other possible water savings opportunities

The result was that almost 90 ML of water could be saved with all the water savings options examined, including the research on reusing the RO retentate.

RO RETENTATE REUSE

The reverse osmosis (RO) plant filters water from unwanted salts, minerals and organic matters in line with strict European and Chinese standards. However, some water is lost as part of this process. This wastewater, called retentate, was investigated whether it can be reprocessed and reused on site.

This investigation included:

- Researching methods and techniques to increase RO efficiency
- Narrowing down options to the most feasible
- Writing up a business case to implement the most viable option
- Tendering to install the recommended solution

PROJECT OUTCOMES

If the suggested changes are implemented:

- Wastewater reduced – sustainability of the plant increased
- Carted water offset
- Less water used in cleaning processes and RO plant
- Water tracked and managed more efficiently