



CASE STUDY

National Foods Cooling Tower Minimisation Study

1. Company profile

National Foods is a major food and beverage group, producing milk, fresh dairy foods, juice, soy, beverages and specialty cheese.

The company is the only milk and juice business servicing the entire Australian market. It is the market leader in fresh milk and produces a range of full cream, flavoured and modified fresh and UHT milks, with leading brands such as Pura, Dairy Farmers, Moove, Farmers Union, Dare, Big M and Masters. National Foods is also the leader in the fresh dairy foods market where the company manufactures a range of yogurts, fromage frais, dairy desserts and cream under brands including Yoplait, Fruche, Thick and Creamy, YoGo and Divine Classic.

National Foods is currently involved in the Victorian Government's water management action plan (waterMAP) program. As part of the program users of > 10 ML of drinking water per year are required to:

- Assess their current water use
- Identify inefficiencies and opportunities for water savings
- Prepare an action plan to implement water conservation activities
- Annually report on implementation of water conservation activities

2. waterMAP Assist

The Australian Industry Group (Ai Group) is committed to working with member companies to encourage continuous improvement, resource efficiency, use of recycled water where possible, and reduced usage of drinking water. Ai Group's waterMAP Assist program has provided resources and funding to member companies to assist them implement initiatives contained in waterMAPs and deliver water savings in industry.

3. Project overview

Ai Group's waterMAP Assist program provided funding to enable National Foods to undertake an investigative study at their Chelsea site to assess water consumption associated with their cooling towers and identify water saving opportunities without impacting on the safety and efficiency of the cooling systems.

The objectives of the investigative study were to:

- Review the existing performance and management practices of cooling towers at the Chelsea site against best practice standards
- Identify areas of uncontrolled water loss from the cooling tower system
- Assess current water treatment practices in context of water usage
- Identify opportunities to reduce and maximise water efficiency of water use in the cooling tower system; and
- Identify potential uses of cooling tower effluent for re-use on-site



4. Key findings

The water minimisation study identified numerous sources of water consumption and water loss, which if rectified, could result in significant water savings as well as financial gains associated with the prevention of water usage, and secondly, subsequent discharge and treatment of that water through the waste water treatment plant (WWTP).

The key findings of the investigative study were:

- Most cooling towers were experiencing losses of water dues to overflow, filter backwash and excessive cooling tower cleans
- Increasing the cycles of concentration on all cooling tower systems would result in reduced water use and tradewaste savings; and
- One of the cooling tower systems was experiencing silica and calcium carbonate scale. Scale of this nature is likely to result in poor heat exchange, which in turn causes increased energy consumption

The investigative study identified a number of water savings opportunities. These potential opportunities are displayed in Table 1.

In addition to the above mentioned water saving opportunities, the investigative study also identified a number of potential additional savings associated with diverting all cooling tower effluent. Potential saving in trade waste fees would equate to approximately \$24,700 (based on 10 cycles) saving by avoiding trade waste disposal. Diverting all bleed-off and any additional water losses and tower dump waters would result in additional savings. Consideration of cooling tower water for alternative usage on-site such as watering gardens, washing activities and even fire management water could result in additional water savings.

Following the investigative study, National Foods addressed all uncontrolled water losses at its Chelsea site resulting in substantial water savings. In addition, National Foods has purchased and implemented new water dosing equipment with the ability to monitor and data log key water quality parameters.

TABLE 1 WATER SAVINGS OPPORTUNITIES

Area	Description
Increase cycles of concentration	Reduced water consumption and bleed off associated with increasing operating cycles of concentration from 10 to 25 cycles
Uncontrolled water losses	Prevent water losses associated with faulty ball valves
Filter operation	Reduced frequency of filter backwash
Cooling tower cleans	Reduced frequency of cooling tower cleans

Further information

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Ai Group's waterMAP Assist program, supported by the Department of Sustainability and Environment (DSE) has enabled Ai Group to work with large industrial water users to identify and implement water savings.