MONASH University

MONASH INDUSTRY TEAM INITIATIVE (MITI)

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Minimisation of Milk Solids and Water Losses to Wastewater

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INTRODUCTION:

COMPANY BACKGROUND:

Warrnambool Cheese and Butter began production in 1888 making them the oldest dairy processor in Australia. The factory began by sourcing milk from a small number of local dairy farmers but has expanded over the years to process approximately 2.5 million litres of milk daily. There are currently seven plants on the Allansford site making a diverse range of products including Cracker Barrel and Coon Cheeses, whey proteins, skim milk powders, and fresh and flavored milks.

PROJECT SCOPE:

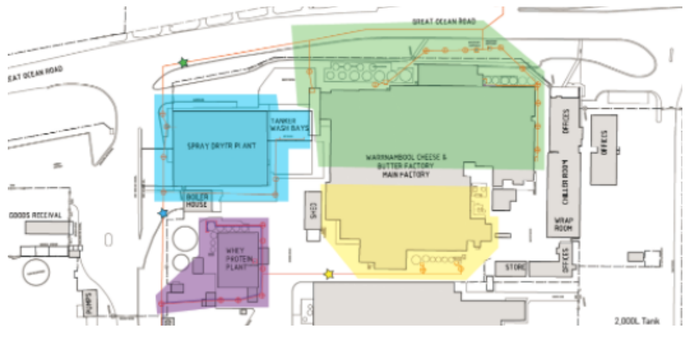
This project aimed to complete the following tasks:

- Investigate mains and wastewater pipe networks
- Develop annual base loads for COD spikes
- Analyse the effectiveness of the LAR Unit in its current location
- Generate a dashboard reporting system for operator and supervisor use
- Form an in-depth gap analysis of waste and mains water infrastructure

PROJECT OUTCOMES:

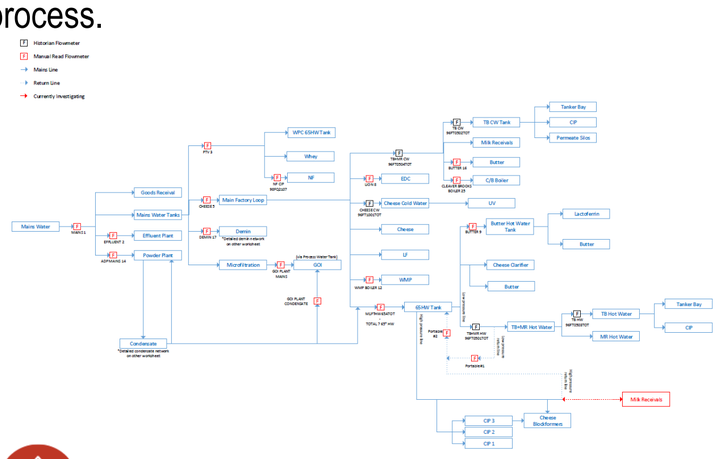
WASTEWATER MUD MAP:

The Effluent Team, Plant Managers and Contract Plumbers were consulted to verify the locations of the wastewater pipes. Manholes and drainage systems have also been included on this diagram, in addition to any relevant flow monitoring devices.



WATER NETWORK DIAGRAMS:

A number of network diagrams were developed to gain an understanding of the various mixing and splitting points of the water systems, with respect to the other items of equipment or main factories. It also shows the locations of flow meters, assisting in the Gap Analysis process.



MAINS WATER DASHBOARD:

A dashboard had been developed for management, supervisor and operator use to highlight the mains and effluent water usage trends. This will act as a daily reporting system and will be an ongoing process maintained by the effluent team.

Date Selected		A Year before date selected	
Cheese Shutdown	Powder Shutdown	Cheese Shutdown	Powder Shutdown
NO	NO	NO	NO

Date	14/02/2017

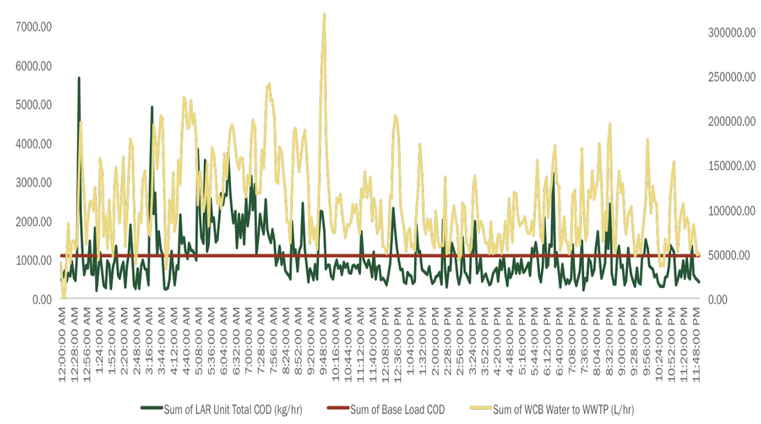
Warrnambool Cheese and Butter Mains Water Use (kL)

Water usage in kL from 7:30 am on 14/2/2017 until 7:30 am on the 15/2/2017

	Current Data					Historical Data		
	14/02/2017	Target	Weekly average	Monthly average	7 Day Trend (Most recent on right)	14/02/2016	Weekly average (A year ago)	Long term average (per day)
Site	1000	1000	1000	1000		1000	1000	1000
Demin	1000	1000	1000	1000		1000	1000	1000
Main Building (Cheese, MR, LF and Butter)	1000	1000	1000	1000		1000	1000	1000
Cheese (total)	1000	1000	1000	1000		1000	1000	1000
Cheese (Mains)	1000	1000	1000	1000		1000	1000	1000
Cheese/MR (65°C Water)	1000	1000	1000	1000		1000	1000	1000
MR (total)	1000	1000	1000	1000		1000	1000	1000
MR (Mains)	1000	1000	1000	1000		1000	1000	1000
Tanker bay (Mains)	1000	1000	1000	1000		1000	1000	1000
MR (Demin)	1000	1000	1000	1000		1000	1000	1000
Lactoferrin (total)	1000	1000	1000	1000		1000	1000	1000
Lactoferrin (Demin)	1000	1000	1000	1000		1000	1000	1000

COD BASE LOADS:

All available data from the time the analyser was installed was collected and analysed to form a COD Base Load. A frequency distribution determined that the base load for the analyser is approximately 1,086 kg/h.



CIP IN RELATION TO COD:

CIP sets and schedules were analysed against COD data, with a focus on the first rinse of the CIP set. It was found that some CIP sets trend with COD spikes, however due to the large frequency and cross over of data no conclusive trend was found

GAP ANALYSIS:

A number of gaps have been noted in the WCB water monitoring network. It was recommended that flow meters were installed on the effluent drains of Milk Receivals and ADP, and that system automation of pumps and valves should be analysed for Cheese, Sungold and EDC factories. To improve the efficiency of water monitoring and safety for staff members it was recommended that mains meters that are currently manually read be converted to automated flow meters that the existing CitectSCADA software can track.

RECOMMENDATIONS:

- Relocation of the LAR Unit to Cheese CIP Kitchen
- Installation of up to 10 flow meters, 15 existing flow meters to be upgraded
- New target for site water consumption
- Fixes to hoses and supports in tanker bay

LEARNINGS:

- Communication and Presentation Skills
- Understanding Data Software for Business
- Developing Interpersonal Skills
- Tackling Real Business Issues

A project initiative of the Victorian dairy industry proudly sponsored by the Gardiner Dairy Foundation in partnership with Monash University

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