



WRINGING WATER SAVINGS FOR A COMMERCIAL WASHER

Identifying water-saving scenarios through a comprehensive water audit

Water is a scarce resource in Singapore. To regulate non-domestic water demands, the Singapore government has enforced a water law starting from January 2015 stating that companies that exceed 60,000 m³ per year in water consumption are required to submit their Water Efficiency Management Plans (WEMP) to the Singapore Public Utilities Board (PUB) annually for three consecutive years. The WEMP should include water minimisation plans which would help to reduce water consumption by 10% annually. In preparation of the WEMP submission and to apply for the Water Efficiency Fund (WEF) provided by PUB, Orchid Laundry engaged DHI to carry out a comprehensive water audit in its premises.

PROJECT BACKGROUND

Orchid Laundry is a company that provides dry cleaning and laundry services for both commercial and consumer customers. 90% of total water consumed during their operations is in the washing process. They are required to submit a WEMP annually to the Water Supply Network Department of PUB for three consecutive years. At the same time, Orchid Laundry is embarking on a recycling project in the premises and is looking at applying for the WEF (Recycling Efforts/ Use of Alternative Source of Water) set up by PUB. DHI has been tasked to assist Orchid Laundry in WEMP submission and identify appropriate treatment technologies to reclaim water.



Laundry washing process area. © DHI

CLIENT

Orchid Laundry

CHALLENGE

Need to:

- Prepare and submit Water Efficiency Management Plan (WEMP) to the Water Supply Network Department (Singapore Public Utilities Board)
- Minimise usage of water and implement appropriate cost-effective water treatment technologies

SOLUTION

Identification of water-saving scenarios through a comprehensive water audit.

VALUE

- Complete submission of mandatory WEMP
- Improvement in water minimisation
- Clearer understanding of water consumption patterns through MIKE Powered by DHI's WEST software
- Reduction in discharge tariffs due to increase in water recycling and reduction in discharge quantity
- Overall cost savings

LOCATION / COUNTRY

Singapore

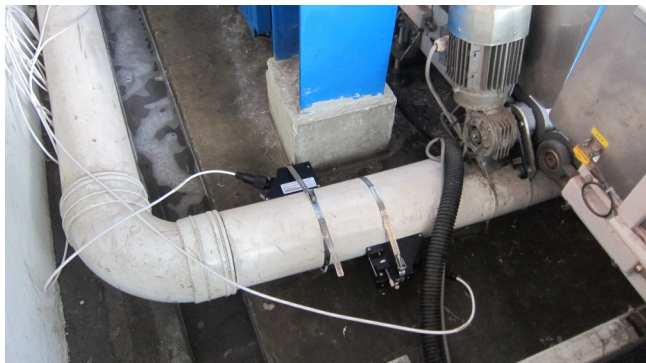
SOFTWARE USED

WEST

DHI'S WATER AUDIT APPROACH

Together with Orchid Laundry, DHI conducted a site survey to document the flow of potable water and NEWater streams within the laundry's premises. NEWater is high-grade reclaimed water produced from treated used water which is further purified for safe consumption. Using information on the client's historical total water consumption and their process water usage, we mapped out a water balance network using MIKE Powered by DHI's WEST software. WEST is our tool of choice as it is able to create a unique block library which can then present the water network in a simplified and interactive manner to be understood by the Orchid Laundry management, as well as the Water Supply Network Department (PUB) when submitting the WEMP.

The water balance network provides a quick and strategised assessment on where the new water meters should be installed. It allows DHI's engineers to identify potential water sources for recycle or reuse to reduce NEWater consumption in the laundry washing processes, which account for 90% of the total NEWater used in the premises. For unmetered pipes, physical flow measurements using clamp-on sensors were used to estimate the potential quantity for recycling. The water samples were sent to the DHI laboratory for analysis while physical water quality parameters were measured on-site.



SIEMENS SITRANS clamp-on ultrasonic flowmeter used for measuring discharged water from the continuous batch washer. © DHI

DHI'S 6RS PRINCIPLE IN WATER MINIMISATION

Our work in this project has assisted Orchid Laundry to understand its water consumption patterns and identify scenarios of water minimisation based on DHI's 6Rs principle: Reduce, Renew, Reuse, Recycle, Reclaim and Return.

CLIENT TESTIMONIAL

“ DHI's industrial water experts have changed my views on how a detailed and properly executed water audit exercise could assist me in effective water management towards greater water savings.

Harry Toh—Director—Orchid Laundry

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- Reduce – application of chemicals could be reduced in the continuous batch washer so that the overall volume of water consumed for rinsing can be lowered
- Recycle – blowdown from cooling tower could be reused for pre-wash and main wash from laundry
- Reclaim – water discharged in the sump is at treatable levels to be used for pre-wash, main wash and first rinse cycle



Discharge water from the boiler and continuous batch washer that has recycling potential. © DHI

PROJECT VALUE TO THE CLIENT

DHI has been recognised for years as a professional consulting firm with the knowledge and expertise to provide targeted solutions to solve tough challenges in different water environments.

In the area of water audit and water treatment technologies, we hold the expertise to provide professional services to help industries improve on their water consumption.

In this project, we have helped our client:

- achieve a clearer understanding of their water consumption patterns through the water balance network created by DHI's WEST software
- maintain compliance with WEMP submission
- obtain WEF subsidy for the installation of new private water meters
- identify potential 30% savings in water recycling through appropriate water treatment processes
- identify options to reduce discharge tariffs owing to an increase in water recycling and reduction in discharge quantity
- assess appropriate water treatment technologies to avoid unnecessary costs in high-end water treatment