

# **LAUNDRETTE ASSOCIATION OF AUSTRALIA**

## **WATER CONSERVATION BEST PRACTICE PROGRAM FOR THE INDUSTRIAL AND COMMERCIAL LAUNDRY INDUSTRY FINAL EVALUATION REPORT**

**Funding Support from**

**Smart Water Fund**

# EXECUTIVE SUMMARY

## OBJECTIVES

Commercial laundries including On Premises Laundries (OPL) are a water intensive industry and use large volumes of water. To help the laundry industry improve its water efficiency, the Laundrette Association of Australia embarked on a project, with funding support from the Smart Water Fund. The Project developed a Best Practice Manual for Laundries that was used as a basis for providing education, training and water usage reviews to demonstrate to the industry that significant reductions in water use are achievable through several financially and practically viable methods.

This project consisted of the following key components:

- Education- On-site training was provided by qualified laundry experts to management, supervisors and laundry operators. The training sessions covered best practise laundry operation, an overview of the importance of conserving our dwindling natural resource with the emphasis of creating a behavioural change in the attitude to water use, and an insight into the most effective technologies available to reduce water usage in a laundry.
- Best Practice Training Manual- The Best Practice Training Manual was developed by Tailored Training Victoria, a registered training organization specializing in industrial and commercial laundry training. The development of the manual used resources available through the various water providers, industry knowledge forged from years of hands on experience, laundry machinery manufacturers, laundry chemical suppliers and direct experience and feedback gained from training more than 400 laundry operators throughout Victoria. The Manual encourages a change of attitude towards our natural resource 'water' and the environment for the laundry operator/manager, then teaches the basics in best practice laundry which enables the operator to dramatically reduce the amount of water used in a typical day's operation. The Best Practice Training Manual includes a range of topics including overloading and underloading of washers, correct sorting procedures and the affects of bleaches and other harsh chemicals on linen and the environment – all facets that if done correctly can reduce water consumption.
- Information Sessions- delivered to industry groups including, coin laundry and dry cleaning, hospital and aged care, hotel and apartment house, developers and architects, delivered at industry trade shows, seminars, conferences, or at specially arranged information sessions.
- Advertising- to the broader industry through a website, merchandising giveaways, signage and banners.
- Water usage reviews- offered free of charge, involving a visit and written report from an industry expert covering water usage in the laundry with recommendations on cost effective ways to save water.
- Follow ups- to provide feedback and acceptance of the program, and to measure the water saving methods that had been implemented as a result of the water usage reviews.

The expected long term outcome of the project is an eventual reduction in water use in the laundry sector by 10 to 20% (120 ML/ year approximately) with further savings predicted if existing equipment is updated.

## **KEY FINDINGS**

It was generally found that the laundry industry as a whole requires education in the basic principles of laundering, which in turn will reduce water usage and improve trade waste discharge quality. Many staff are untrained, and possess little knowledge of best practise laundry procedures. Overloading and underloading of washers is common practice in many laundries. Incorrect sorting procedures, unnecessary rewashing and general bad practices were found consistently. This is especially evident in the aged care and hospitality laundry sector.

Overuse of chemicals is common practise in many laundries, with chemical suppliers usually given the responsibility of setting dosage amounts to the level they desire. Rewash levels, which should be at 1-6% depending on the type of textile to be laundered and the degree of soiling is often as low as 0%. Where powdered chemicals are used, over use is common practise.

Old and inefficient washing machines were found on a regular basis, with general maintenance neglected. The use of top loader washers in health and aged care laundries, dry cleaners, coin laundries, and motel laundries is still common place often using double the quantity of water of a modern front loader.

The large commercial laundry sector, especially those who predominantly supply the states hospitals and aged care facilities were generally found to be extremely water efficient, with best practice the norm in this area of commercial laundry. As laundry is not only their core business, but their sole purpose, generally knowledge of best practice laundry is evident, not only with management but also with supervisors, leading hands and the like.

Most managers attend regular industry seminars, meetings and trade shows such as those run by the Textile Rental Launderers Association TRLA, Victorian Institutional Launderers Association VILA and the annual Launtex Seminar. Some even travel overseas to keep abreast of latest technological advances and improved processes and systems.

Many large commercial laundries operate Continuous Batch Washers CBW which are the most water efficient washing machines available in the world. Typically a CBW uses 5-7 ltrs of water for every kilo of linen washed. This compared to smaller laundries where the ratio can be more than 20 litres of water to 1 kg of linen.

Chemical companies such as Ecolab and Campbell Cleantec have developed state of the art water recycling and heat recovery systems which further reduce water consumption. This technology is rapidly becoming the norm for many large commercial laundry operations.

Most of these laundries are usually in the top 10-20 users of water in each water provider's area, so water management and water reduction plans are assisting these laundries further.

## KEY RECOMMENDATIONS

### ***Water Recycling***

The ability to recycle water in a commercial/industrial laundry application is not a new idea. It is generally accepted that the last rinse water used in an industrial washer extractor can be re used as a Prewash for the next wash cycle. Larger commercial and industrial laundries have been utilizing this technology for decades, generally, where laundry throughput is 30,000 kgs per week or more. Smaller laundry operations have generally not been interested in water recycling due to the long payback of the system often equating to 10 years or more. A space limitation for storage of reusable water has also made water recycling impractical for most applications. In recent years, washing machine manufacturers and specialized plumbing services have designed systems that are less expensive and dynamically designed with space requirements.



Pictured above right, Ipso 23, 16, and 9.5 kg washer extractors with WaterSaver® recycling tanks. Relatively inexpensive water recycling tanks doubling as a plinth to raise loading height of washers. Compatible with Ozone Laundry technology these tanks are proving to be quite popular in aged care facilities across Victoria. Expected water savings of 20% are achievable with this type of system.

### ***Improved linen type and design***

The Cerrisse linen system involves replacing traditional blankets with a non washable doona, with washable doona cover. This unique system not only saves water use in the laundry by 75% compared to washing blankets, but reduces labour in changing beds, is totally OH&S friendly for nursing and care staff, and reduces gas usage in drying considerably. The Cerrisse system is the first of several new linen developments available with an ROI typically of 6 months.



Above, the unique Cerrisse linen system which is replacing the need for traditional blankets in hospital and aged care facilities around Australia.

### ***Ozone Laundering***

Ozone burst on to the scene in the U.S and Europe in recent years and is now available through several manufacturers here in Australia. Ozone can reduce water consumption by 40%, allow bacteria free cold water washing, improve trade waste sewer quality, reduce gas and electricity costs, extend linen life and is safer on delicate personal clothing in aged care laundries. Ozone has a unique ability to maintain and in most cases improve whiteness and color in linen. Ozone laundering, when coupled with a failsafe device and regular validation of process (bacteria testing) conforms to Australian Standards and with an ROI of 18 months (on average) is fast becoming a popular choice for new and existing laundries throughout the country.



*Affordable for small hotels...*

Above left, an ozone laundry bolts on the wall and can be used for new and existing laundries

Above middle, ozone fitted to a 16 kg Ipson washer

Above right, ozone is suitable for hotel, motel, hospital, aged care, and commercial/industrial laundry applications up to any size.

### ***Staff Training***

Staff training in basic principles of laundry practise is available through several Registered Training Organisations and TAFE Colleges throughout Victoria. Training can consist of one off sessions with laundry staff and management, or with more comprehensive programs such as Government sponsored Certificate II, III and IV in laundry operations courses. Today, most training is conducted on site by qualified and experienced laundry professionals. Training can not only reduce water consumption but reduce all other utility costs, improve production, improve quality, extend linen life, and reduce OH&S risks.

### ***Update old washing machines***

Not only do top loading washers use up to 100% more water than new efficient front loading washers, they do not wash very well. Soiling test results in both types of washers consistently show front loaders perform much better. If an industrial or commercial laundry requires hygienically clean linen and clothing (which all should) toploaders cannot guarantee bacterial and viral disinfection. This is especially crucial in health and aged care where it is a requirement by various governing bodies to provide laundry to a hygienic standard.



Above, a current aged care laundry operating an old top loader and 40 yr old inefficient front loading washers.

### ***Rain water capture***

Again, not a new idea yet is potentially a significant potable town water supply water saver. The main resistance is the difficulty in modifying existing building and finding suitable locations for large storage tanks to capture bulk water during heavy periods of rainfall. In addition, water authorities require additional meters to charge for trade waste. The concept could possibly gain a small footing should there be opportunity to waiver trade waste costs and incentives businesses to consider this option with greater favour. Architectural firms promoting the concept at time of the building design would best serve introduction and implementation.

### ***Chemicals dosage analysis and wash programming***

The laundry industry relies totally on chemical companies to formulate dosages of chemicals for best outcomes in the laundry. Unfortunately many chemical company representatives do not take into account the importance of best quality trade waste when calculating their formulations, nor water minimisation. The easiest thing for a chemical representative to do is increase dosages of alkali, detergent, and bleaches to make the linen cleaner and whiter. This is not recommended as trade waste quality can be affected, as well as undue degradation to linen.

### ***Machinery maintenance***

Washer maintenance is imperative for efficient operation. Several instances had been seen where the drain valve of the washer had been leaking creating an excessive use of water. Leaking drain valves are a regular occurrence in all industrial washers. This is often caused by foreign objects such as tools, surgical instruments, bra wires and the like getting caught in the drain valve. Water levels inside washers should be monitored on a daily basis by visual inspection. Not only do these problems waste water, they can often do damage to the washer and affect wash quality both hygienically and aesthetically.

## **PROGRAM DESCRIPTION**

### **Education**

Training sessions were held for laundry staff and management at 50 laundries throughout Melbourne. A total of 62 staff attended the sessions which were held on site during staff normal working hours. All staff who were deemed competent, following completion of the written assessment were presented with SMART WATER training certificates.

There are many misconceptions when it comes to basic laundry understanding. Many of these misconceptions come from chemical companies, machinery manufacturers, infection control fraternity, nursing management, hospitality management, and commercial media and advertising.

Chemical company representatives often suggest more chemicals for better wash results. The problem here is that the more chemical used the more water that is often required to rinse those chemicals out of the linen. Often there is little regard for the damage these chemicals will do to the environment.

Often loads are not sorted by degree of soiling, this leads to linen and clothing being subjected to extremely high levels of chemicals and massive amounts of water when most of the load only required half as much chemical and water.

High levels of alkali used in the wash process generally require high levels of acids to balance the ph of the load at the end of the cycle. When often limited alkali could have sufficed.

Different types of textiles require different loading ratios in a wash process. Therefore a basic understanding of textiles and fibres is necessary to launder correctly.

Different soil types require variations in the wash formula and chemical additives. More bleach is not always the answer.

Water quality has a massive affect on wash formulation. It dictates types of chemicals that should be used, and also affects recommended loading ratios.

Washing machine manufacturers often encourage laundry staff to overload washing machines, as this can alleviate vibration and shaking in some front loading washer extractors. The problem here is that linen rewash rates go up, meaning more water is wasted in rewashing. Hospitality management are often guilty of this practice as they believe it will improve production and reduce labour costs.

Some infection control specialists and management in the health and aged care sectors unnecessarily advice laundry operators to sort articles in to various categories. This leads to part loads and enormous increases in water usage.

Many laundry staff, whether they are in a small hospital, an aged care laundry, a serviced laundrette, a motel or hotel laundry do not understand the basics of laundering. In many ways our ancestors who used rocks and water from the river, understood laundry better than the laundry workers of today.

A water management and action plan in many laundries, especially when it is not their core business is a completely foreign idea to laundry workers and managers. The manual addresses the basics and provided impetus to work through and implement plans to reduce water consumption.

A brief introduction to some of the new technologies available is also a great way to generate discussion and hopefully instigate management to investigate further.

The topics covered included:

## **WATER FACTS**

Where does our water come from?

Why is there so much focus on water conservation?

## **WATER AND ITS ROLE IN THE LAUNDRY**

Why do we need water?

What role does water play in the washing process?

How does water work with detergents?

## **SOIL TYPES ~ ACIDS, ALKALIS AND SOLVENTS**

Different soil types

Acids, alkalis and solvents

How is this relevant to laundries?

### **TEXTILE TYPES**

Natural fibres

Man made fibres

### **WATER QUALITY**

Soft water.

Hard water

Minerals and impurities

### **WASH PROGRAMS**

Filling Factors

Sinners Circle

Rewash

### **WHERE IS WATER WASTED IN A LAUNDRY?**

Sorting

Washroom

Drying

Finishing areas

Packing and dispatch

### **IMPLEMENTING CHANGES**

Making a plan

Implementation and monitoring

### **SUMMARY**

Where to start?

What can you do?

New technologies as well as Old Ideas Revisited

Help and assistance available

## INFORMATION SESSIONS-

Information sessions were held at several industry forums including the following:

<b>INFORMATION SESSION NO 1</b>	Laundrette Association  Site: Quest Inn Carlton No attendees: approx 40	LAA Trade show, one hr presentation on training and reviews for laundrettes, tips on water savings, new technologies, attended by self service and serviced laundrette owners
<b>INFORMATION SESSION NO 2</b>	Laundrette Association  Site: Dial a Laundry Richmond No attendees: approx 30	Dial a Laundry plant tour, one hr training presentation, hands on discussion, demonstration on stain removal tips, new technology, water saving and chemical usage, attended by serviced laundrette owners
<b>INFORMATION SESSION NO 3</b>	Textile Rental Launderers Association  Site: Vecci Melb No attendees: approx 20	TRLA scheduled meeting, 35 min introduction to Smart Water Laundry Program, overview of all aspects of Smart Water program. Attendees included commercial laundry owners, managers, supervisors and associated traders
<b>INFORMATION SESSION NO 4</b>	TRLA and VILA Annual Conference  Site: Mercure Hotel Geelong No attendees: approx 100	45 min presentation to approx 100 commercial and institution laundry operators and managers. Topics included intro to Smart Water Program, overview of VIC water resources, general discussion covering water saving technology. Attended by commercial laundry owners, supervisors and associated traders

<b>INFORMATION SESSION NO 5</b>	Victorian Aged Care Seminar/Conference	40 min presentation to approx 80 aged care facility operators and managers. Topics included discussion covering water saving technology, both new and old, success stories etc, attended by aged care operators, facility managers, Directors of nursing, maintenance staff, nursing staff.
	Site: Caulfield Racecourse No attendees: approx 1100	
<b>INFORMATION SESSION NO 6</b>	Laundrette Association	Presentation to new and existing laundrette owners on "How to operate an efficient laundrette", covering technology, installation, maintenance etc. Attended by existing and potential laundrette owners
	Site: Plough Hotel Footscray No attendees: approx 50	

Please note, information sessions can be attended by contacting one of the industry bodies, ie TRLA, VILA, LAA.

## ADVERTISING AND TRADE SHOW

Advertising included a 'banner bug', pens and glasses which were handed out at info sessions and trade shows.

A trade show booth was hired at the Aged Care Expo at Caulfield Racecourse with more than 1000 aged care operators, managers and staff attending.

## WATER USAGE REVIEWS

Water usage reviews were conducted at 51 laundries in all the market segments.

The review included information such as:

LAUNDRY TYPE

LAUNDRY CAPACITY (KGS) PER WEEK

NUMBER OF PRODUCTION STAFF

TRADE WASTE AGREEMENT

WASHER DESCRIPTIONS *(Generally, the older the washers the more inefficient they can be)*

Average water usage per week *(This was used to cross reference with washer models to identify inefficiencies with water use)*

Water usage per year KL *(as above)*

Estimated cost to facility: *(it was important to indicate to the facility the real costs)*

Check for leaks on drain valve of washers *(one common cause of inefficiency)*

Are leaks checked regularly *(should be conducted regularly)*

Cooling pit (*local trade waste regulations usually require a cooling pit to keep waste water discharge below 38 deg C*)

Chemical company (*For feedback to chemical companies if required*)

Liquid / Powder (*powders can be inefficient and harmful to environment in some cases*)

Copy of programs (*to identify water wastage, which is common*)

Wash programs analysis (*as above*)

Rewash levels (*to identify if levels significantly above or below industry standards*)

Back Flow prevention

Sorting procedures (*crucial to overall efficiency*)

Loading ratios (*as above*)

Training (*laundries where staff are trained well are always more efficient*)

Roof size (*to identify possibility of rain water capture*)

The review was then studied and viable recommendations were made to the facility on practical ways to reduce water consumption.

## RESULTS

### KEY FINDINGS AND RECOMMENDATIONS PER MARKET SEGMENT

#### COIN LAUNDRY

**Findings** - A gradual move towards front load washers is taking place, however many old laundrettes are still utilising top load water inefficient washers. Perhaps half of the new laundrettes installed in the last few years are still installing top load washer instead of front load.

It is very difficult in this market to control the wash cycles that the customers use and ensure loading of washers is efficient as the general public accounts for perhaps 75% of the wash loads processed.

Several progressive laundrette owners do not allow self-serve consumers to add their own detergent but instead provide automatic dosing as part of the vend price. This assists greatly in minimising the pollutant load to the sewer and should be promoted more by the chemical vendors and the association. Unfortunately there is no cost incentive in trade waste cost reduction for laundrette owners to adopt automatic detergent dosing.

Overall, the industry is moving in the right direction towards water minimisation however progress is very slow. Until water and trade waste prices increase significantly or AAAA+

water efficiency machines become mandatory for new laundrette DA approvals, change will continue to be slow.

**Recommendations-** Staff training, improved signage, replacement of top loaders and the abolition of powdered chemicals were all common recommendations in this market.

## **HOSPITALITY**

**Findings** – An industry that talks a lot about being environmentally friendly and promoting water conservation in their hotel rooms, back of house is still a problem area and investment in green technology is slow even when attractive paybacks are demonstrated.. Most capital is invested in visual areas where guests have access to and often capital is lacking for back of house activities.

Laundry staff with limited literacy skills and no formal laundry training are often employed to work in hotel laundries. Processes and procedures often lack consideration for water use reduction. Again, significant cost of water and trade waste would assist in the faster development of adopting water saving technology.

**Recommendations-** Ozone technology, water recycling, staff training, chemical and rewash monitoring were all relevant suggestions to the hotel market.

## **AGED CARE**

**Findings** – A fast changing industry with corporate organisations investing heavily in buying into the industry. Capital for new technology is scarce as most funds are being invested in additional facilities in the hunger to grow the organisations. Aged care is prepared to adopt recommendations for water use reduction provided that the standard of care they offer is not compromised, and the return on investment is attractive.

**Recommendations-** Ozone technology, water recycling, staff training, rewash and chemical monitoring.

## **DRY CLEANING**

**Findings** – Many dry cleaners have old top loading washers for washable textiles, and little or no consideration is given to water use reduction as the cost of water in washing is relatively insignificant to this type of business compared to the cost of labour, equipment, chemicals and other utilities.

**Recommendations-** Replacement of top loaders and old washing machines, but mainly changes to wash programming and chemical additions.

## **COMMERCIAL/INDUSTRIAL**

**Findings** – Generally this sector is by far the most efficient in its use of water. Water use is very much a focus with equipment suppliers continually using water reductions as a marketing tool. Staff training in policies and procedures is comprehensive, maintenance is usually carried out regularly and with detail. Chemical dosages and rewash levels are monitored daily, and water usage planning is commonplace with the larger laundries.

**Recommendations-** Further staff training and monitoring of chemicals and rewash was the most common recommendation, but actual savings could not be determined at the time of follow ups.

## **SUMMARY**

The results obtained from follow ups indicated that the Smart Water Program directly resulted in a 12,989 KL reduction in water use per annum. It is worth noting from the comments received that many laundry facilities have planned to implement recommendations made from the water usage review within 3 years. Of the laundry businesses visited as part of this project, expected water savings are 45,244 KL per annum over the course of the next three years from identified water savings of 57,061KL per annum.

Whilst water conservation is a topic that all the operators were keen on hearing about, the fact constantly remains, that implementation of these ideas is looked at positively, provided the operator some see some financial benefits. A fast return on investment is crucial for any business.

The Smart Water program has been successful because the ideas and technologies suggested have offered the operator a favourable financial outcome. This was the key to the success of the program.

The program has been a great success, and the flow on from being able to recommend these ideas will have far and reaching results in the relative industries, as facilities and suppliers will showcase their ideas to other laundry facilities not just in Melbourne, but regional Victoria and Australia.

## **CASE STUDIES**

### **Aged Care**

An aged care facility laundry in Melb with 190 high care residents was using approximately 3500 KL of water in their laundry every year.

Following the Smart Water Laundry program the facility adopted Ozone technology to reduce their overall water usage by 1400 KL per annum, a 40% reduction. Ozone also allowed the use of cold water only, which saved 100% gas and electrical heating of the wash water. Other savings included 35% reduction in gas use for drying, a 10% reduction in labour, 50% reduced chlorine bleach use, 100% reduction in hydrogen peroxide, and an overall increase in linen life by 20%.

The return on investment for the ozone technology is expected to be less than 14 months

### **Hospitality**

A Melbourne hotel laundry catering for up to 390 guests at any one time installed an Ozone laundry system following the Smart Water program. The cost of the system was offset by savings made in water, gas, electricity, and labour. The estimated payback on the implementation of ozone is expected to be less than 16 months. The linen is whiter than previous, and the towels are softer and fluffier than ever.