



# 1008 - Western Health

## Water Saving Sterilizers Final Report

March, 2005

<b>Name:</b>	Western Health
<b>Project Description:</b>	Water Saving Sterilizers
<b>Milestone Number and Title:</b>	Final Report – Benefits Assessment
<b>Date of Milestone Report:</b>	10 March 2005

### About Western Health

Western Health offers a comprehensive range of health and related services to Melbourne's west. More than 4,000 people work for Western Health, providing services for a population of 567,640 people covering a catchment area of 1,335 square kilometres.

Western Health cares for its community through Sunshine Hospital, The Williamstown Hospital, Western Hospital (Footscray), DASWest Drug & Alcohol Services, and sub acute and acute residential services that include Hazeldean Nursing Home and Reg Geary House. Western Health provides emergency medicine, general medicine, surgery, aged care and rehabilitation, paediatric (children), obstetric (maternity) and gynaecology (women's reproductive health) services.

In any one day Western Health

- Cares for 913 inpatients
- Provides 389 outpatient sessions
- Treats 300 people in Emergency Departments
- Performs 65 operations, and
- Delivers 8 babies into the world

With major facilities in operation 24-hours a day, environmental sustainability is an ongoing project at Western Health. In line with the Victorian Government's policy to reduce greenhouse gas emissions by 15% over five years, Western Health has introduced sophisticated controls which provide continual opportunities for energy savings.

In recent times the need for water conservation has been highlighted. A target has been set to reduce Melbourne's water usage by 15% on a per capita basis and recycle 20% of wastewater by 2010. Furthermore, the Victorian Government has recently requested that the top 200 water users prepare a 'Water Management Plan' to contribute to long-term water conservation and savings for Melbourne.

Western Health has identified areas across all hospitals in which water savings could be achieved.

### Background

Central Sterile Supply Department's (CSSD) are located at Sunshine Hospital, Western Hospital and The Williamstown Hospital. These departments are responsible for maintaining infection control within Western Health and the local community. Contaminated (used) medical instruments are sent to the department both from internal sources, as well as local General Practitioners, to be inspected, cleaned, sterilised and packaged for reuse.

Medical instruments are sterilised using a Hi Pre-vacuum steriliser. Western Health has a total of nine Hi Pre-vacuum sterilisers across the network, four at Sunshine Hospital, three at Western Hospital and two at The Williamstown Hospital.

After going through a washing process the instruments are placed in the steriliser. They then go through a conditioning process before the air is removed to create a vacuum seal. Once the seal is in place, steam is injected at 134° for four minutes to sterilise the instruments. After this sterilisation, the vacuum seal is broken to allow for the drying process. A complete cycle takes 35 minutes.

The steam condensate leaves the sterilisation process at 80° and after being cooled by cold water in a condenser that is fitted to the steriliser, is discarded as waste via the sewerage system. The rate of this waste was approximately 11 litres per minute during each 35-minute cycle. It was identified that this waste water could be better used.

An additional 11 litres per minute of cold water is used by the liquid ring vacuum pump to maintain a seal. This is also discarded as waste.

### **The Initial Proposal**

Western Health originally identified two options to reuse wastewater. The first option looked at using the water for flushing toilets.

The second option looked at modifying the sterilisers so that once the sterilisation process completes, the waste condensate could be cooled to the legal limit by chilled water at 7 degrees Celsius (through a cooling coil) which is then recirculated. The vacuum pump water is also cooled and reused. At the time of the submission, discussions were in progress with the steriliser manufacturer to determine whether it would be possible to achieve this option.

The Hospital's air-conditioning systems provide the source of chilled water, that is circulated around the building for cooling purposes. This chilled water is produced by chillers in a central plant and circulated around the Hospital in a closed loop. The Hospital's tapped into this closed loop and used the chilled water to also cool the condensate and pump seal water. The water then returns to the chillers where it is cooled again and pumped back into the system.

Both options provided the same level of water savings.

### **Preferred Option for Implementation**

After further investigation a number of difficulties were identified in the reuse of wastewater for flushing toilets. These included:

- Space requirements and storage problems with respect to Legionella issues
- Infrastructure issues which would create redirection problems
- City West Water concerns about the quality of waste water

In the meantime however, it was determined that the Hi Pre-vacuum sterilisers could be modified to allow for the recirculation of water. Upon receiving a Smart Water Fund grant, Western Health decided to undertake these modifications.

The steriliser manufacturer priced the modifications of the existing sterilisers at \$1,800 per unit. The total cost amounted to \$16,200.

Western Hospital received funding to replace all three sterilisers. These sterilisers were then manufactured with a chilled water option and installed as such.

The installation process was designed in house to take into consideration the varying infrastructure and existing pipe work. Similarly, the installation costs also varied across sites.

The final breakdown of the costs were Sunshine Hospital \$ 24,000, Western Hospital \$22,000 and The Williamstown Hospital \$14,400

### **Program timing**

The initial program aimed to have all steriliser modifications completed by December 2004. However, due to unforeseen delays, the completion date was extended until the end of February 2005.

### **Water usage and cost analysis (using current Tariffs)**

<b>Item</b>		<b>Unit</b>
Flow rate of cooling water	22	litres per minute
Time for each circle	35	minutes
No of cycles per day per unit	8	
No of sterilisers used daily	9	
No of cycles per year	26,280	
Quantity of water used per year	20,235,600	litres per year
Quantity of water saved	20,235.6	kilolitres per year
Cost of water used (83.25 c/kl)	\$16,846.14	
Cost of sewerage (95.36 c/kl)	\$8,104.60	
<b>Cost savings per year</b>	<b>\$24,950.74</b>	
Capital cost	\$60,400.00	
Smart Water Fund contribution	\$50,400.00	

### **Project status**

The project was completed by mid February 2005.

To-date the project has been promoted externally via the local media. It has also been promoted through Western Health community newsletters, which are distributed to 141,000 homes. Internally, it has been promoted through Western Health's staff newsletter.