

# Cooling towers and recycled water

To reduce demand on our fresh drinking water supplies, Victorians are increasingly using alternative water supplies for purposes that don't require such high-quality water. These alternative supplies include roof-collected rainwater, stormwater, recycled water that has been derived from greywater or sewage, and industrial waste water.

Many businesses with cooling towers are now considering ways to help reduce drinking water consumption, by either:

- Using alternative water supplies in cooling tower systems; or
- Recycling cooling tower bleed or waste water (also known as 'industrial water') for other purposes.

This bulletin provides information on managing the human and environmental health risks that may be associated with these water-saving measures.

## Use of alternative water supplies in cooling towers

With appropriate management controls, alternative water sources can be used to supply or supplement cooling tower systems. The controls required will depend on the source of water used, and will need to address two key risk areas:

- 1 The alternative water supply enhancing the growth of *Legionella* in the cooling tower system.
- 2 Contaminants such as pathogens in the alternative water supply causing harm in individuals who are exposed to the water (either directly or via aerosols).

*A Guide to Developing Risk Management Plans for Cooling Tower Systems* has been developed to assist industry in managing potential *Legionella* risks in cooling tower systems. Owners and managers of cooling tower systems have responsibilities under the *Building Act 1993* and the Health (*Legionella*) Regulations 2001. Of particular importance is the requirement to develop a risk management plan that addresses nutrient growth and poor water quality. This plan should include a specific assessment of the alternative water supply. It should be noted that using water from an alternative supply may result in an increased risk classification and subsequently change the Operational Program that is required. Figure 12 from *A Guide to Developing Risk Management Plans for Cooling Tower Systems* will assist with evaluating the critical risks and how this translates to a risk classification. Attachment 7 of the guide provides indicative water quality target ranges for cooling tower systems, which may assist in designing an appropriate water treatment program. The water treatment service provider for the cooling tower should be able to assist in ensuring the water treatment program adequately addresses the water quality for the system.

The risk of contaminants in the alternative water supply causing harm to humans can be addressed by following the relevant guidance, as described below.

In using an alternative water supply in a cooling tower system, the potential for physical or chemical water quality aspects affecting or damaging the system, for example through corrosion or scaling, should also be considered (this issue is not addressed any further in this information bulletin).

### Rainwater and stormwater

The use of roof-collected rainwater in cooling tower systems is addressed in the Department of Human Services' guideline *Rainwater Use in Urban Communities*.

Stormwater is run-off that is captured from land (usually from paved surfaces) during rainfall events. The Australian Guidelines for Water Recycling, Phase 2 (draft) document *Stormwater Harvesting and Reuse* provides a best practice framework for assessing and managing stormwater quality for recycling. It is recommended that a suitable consultant or other appropriately-trained individual is engaged to undertake a specific assessment in accordance with these guidelines if the use of stormwater for a specific cooling tower system is being considered.

There are no specific regulatory or approval requirements for the use of rainwater or stormwater in cooling tower systems (aside from the general regulatory requirements relating to all cooling tower systems described above).

### **Recycled water from sewage or greywater**

Recycled sewage that meets the water quality standards described in the Environment Protection Authority's guidelines *Dual Pipe Water Recycling Schemes* is considered to be of a suitable quality for use in cooling tower systems. Proposals to recycle greywater for cooling tower system use may need a specific risk assessment to identify appropriate water quality standards. This can be undertaken using the principles in the *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks*. Contact the Department of Human Services for further advice regarding this.

In some cases an approval for the treatment and use of recycled sewage and greywater is required. You should contact the Environment Protection Authority to discuss any approval requirements.

### **Use of cooling tower waste water**

Bleed or waste water from cooling towers can sometimes be used for other purposes, such as toilet flushing, garden watering or other industrial processes. In some cases an approval is required for these types of industrial water recycling projects - contact the Environment Protection Authority for further information.

A risk assessment should always be undertaken to determine if any contaminants in the water (such as microorganisms or chemicals) will pose a risk to human health or the environment. There is currently no guidance that is specific to cooling tower systems to assist in undertaking this type of risk assessment. However, the principles in the *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks* can be used.

It is recommended that a suitable consultant or other appropriately-trained individual is engaged to undertake a specific risk assessment if the use of cooling tower waste water is being considered.

### **Relevant guidelines**

- *A Guide to Developing Risk Management Plans for Cooling Tower Systems*  
Department of Human Services Victoria (2001)  
Available from [www.health.vic.gov.au/environment/legionella](http://www.health.vic.gov.au/environment/legionella)
- *Rainwater Use in Urban Communities*  
Department of Human Services Victoria (2007)  
Available from [www.health.vic.gov.au/environment/water/tanks](http://www.health.vic.gov.au/environment/water/tanks)
- *Australian Guidelines for Water Recycling – Stormwater Harvesting and Reuse* (draft)  
National Water Quality Management Strategy (2008)  
Available from [www.ephc.gov.au/ephc/water\\_recycling.html](http://www.ephc.gov.au/ephc/water_recycling.html)
- *Australian Guidelines for Water Recycling – Managing Health and Environmental Risks*  
National Water Quality Management Strategy (2006)  
Available from [www.ephc.gov.au/ephc/water\\_recycling.html](http://www.ephc.gov.au/ephc/water_recycling.html)
- *Dual Pipe Water Recycling Schemes*  
Environment Protection Authority Victoria (2005)  
Available from [www.epa.vic.gov.au/publications](http://www.epa.vic.gov.au/publications)

### **Contacts for further information**

#### **Department of Human Services**

Environmental Health Unit  
Phone: 1300 768 874  
[www.health.vic.gov.au/environment](http://www.health.vic.gov.au/environment)

#### **Environment Protection Authority**

Information Centre  
Phone: (03) 9695 2700  
[www.epa.vic.gov.au](http://www.epa.vic.gov.au)