



## The Toolkit

The “Toolkit” comprises a number of resources to assist in the evaluation of Regional Roof Water Harvesting as a means of sourcing the additional water needed for growing urban communities.

Key cities and towns with a high likelihood of successfully adopting this water supply option are identified; a risk assessment example details typical risks to be managed and a computer program provides a tool to undertake locality specific evaluations for use by government and developers alike.

The urban catchment model has significant scope for supplementing water supply throughout the medium to high rainfall (>700mm) coastal

development belt of Australia where rapid population growth is driving new residential development around urban centres.

The term ‘Roof Water Harvesting System’ refers to the infrastructure required to collect rainwater from individual rooftops within a new residential subdivision and then transfer, store and treat this water before it is added to the local drinking water supply.

### The Toolkit Program

The Toolkit program, available on CD, has been developed to assist in assessing the financial viability of roof water harvesting systems within Australia and allow quick comparisons with other potential water supply sources.

**The Toolkit allows a Roof Water Harvesting System to be defined in terms of the collection system, transfer pipelines, storage basins and a treatment plant through entering a number of key parameters.**

**Estimates of the capital and operating costs associated with the construction and operation of the roof water harvesting system are then calculated and a time-series simulation is run to estimate the volume of water harvested by the system annually. The Toolkit then calculates the net present cost (NPC) per Megalitre. The cost/ML can then be compared with other water supply options being considered to service the growth in demand.**



The flexible setup of the Toolkit program allows a range of roof water harvesting systems to be defined with different arrangements for the transfer pipelines, storage basins and treatment plant.

The Toolkit's estimates are primarily based on the extrapolation of data obtained from a roof water harvesting system prepared in Warrnambool for the Aberline Road subdivision. They allow for construction cost variation across Australia by applying appropriate cost factors and rainfall variation by using different temporal rainfall patterns.

**The Toolkit is for preliminary screening of options on a relative cost basis and should not be used as a design or cost estimation tool.**

- Calculations rely on a number of assumptions and relationships derived from limited data sets.
- Results are suitable for preliminary screening only and should not replace a more detailed assessment by an appropriately qualified and experienced person.

### Viability

The principle of collecting roof water is well understood, as is the installation of pipes to convey the water. Conventional pipe materials are proposed to be used which have a long life (>50 years) and are durable. Operating the pipe network under small pressures is done on a small scale with individual household collection systems. The extension to a regional scale can be confidently achieved through good engineering design.

The Warrnambool system has been designed to allow water to flow under gravity into an open, above ground storage, utilising the natural elevation of the catchment. This required the delivery pipe to be a sealed pressure rated pipe rather than conventional stormwater pipes and pits. The advantage of this arrangement is minimising contamination points, reduced operating costs

and virtually no greenhouse gas emissions. The Toolkit is configured to allow such an arrangement to be repeated or a pumped pipeline to be installed.

Yield of roof water is determined using Bureau of Meteorology rainfall data sets and a conservative runoff coefficient of 0.85. **Run the Toolkit program to see if roof water harvesting is viable in your area.**

### Risk Assessment

A preliminary water quality risk assessment was undertaken for the Warrnambool roof water harvesting scheme using the steps outlined in the Australian Drinking Water Guidelines (ADWG). All risks identified can be effectively managed. A copy of this preliminary water quality risk assessment is located on the Toolkit CD to demonstrate the type of risks that need to be assessed before implementing such a scheme. Some towns or cities may have other risk specific to their environment, such as particulate matter that settles on roofs that would need to be assessed.

### THE TOOLKIT CD

The CD contains

- Animation of the concept
- Installation of supporting software to run the Toolkit
- The Toolkit program
- Report on towns where principle could be applied
- The Case Study site - Risk Assessment

Funding for the Roof Water Harvesting Project, including the Toolkit, has been provided through the Australian Government "Water for the Future Program" and from the Victorian State Government "Stormwater and Urban Recycling Fund".



Australian Government  
Water for the Future

