

# Submission

## Melbourne's Future Water Supply Inquiry

### To

Executive Officer  
Environment and Natural Resources Committee  
Parliament House  
Spring Street  
East Melbourne VIC 3002  
Australia  
Via email [enrc@parliament.vic.gov.au](mailto:enrc@parliament.vic.gov.au)

### From

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I confirmed that I could make a late submission for consideration by this inquiry via telephone on September 16, 2008.

This submission can be treated as a public documents

### Terms of reference

The Environment and Natural Resources Committee is required to inquire, consider and report no later than 31 December 2008 on the relative merits of supplementing Melbourne's water supply by some or all of the following means:

1. further water savings that can be achieved by increased conservation and efficiency efforts;
2. the collection of stormwater;
3. the re-use of treated waste water;
4. the use of groundwater;
5. small locally based desalination plants;
6. any other optional water source which appears to the Committee to be appropriate.

**Source:** <http://www.parliament.vic.gov.au/enrc/inquiries/Water/terms.html>

# Contents

1. Introduction.....	3
2. The Victorian government's water plan .....	3
2.1. The Wonthaggi desalination plant .....	3
2.2. Modernising Victoria's irrigation system .....	4
2.3. Expansion of Victoria's Water Grid .....	5
2.4. Upgrading Melbourne's Eastern Treatment Plant .....	6
2.5. Supporting new and existing water conservation programs for homes and industry.....	6
3. Increased conservation and efficiency efforts .....	6
4. The collection of stormwater; .....	7
5. The re-use of treated waste water .....	8
6. The use of groundwater .....	8
7. Small locally based desalination plants .....	8
8. Stopping logging in water catchments .....	9
9. Restrict filling of swimming pools to rainwater only .....	10
10. Summary.....	11

## 1. Introduction

I make this submission as a private individual concerned about ensuring that Melbourne and Victoria have sustainable water supplies over decades to come.

It has been noted by the CSIRO that climate change impacts have resulted in greatly reduced rainfall over Melbourne, its water catchments and the rest of Victoria.

Unfortunately, this trend has continued for over ten years so we are now facing a reality of greatly reduced water availability, rather than a temporary drought that may break.

Victoria's rainfall reduction far exceeds the worst-case predictions by the CSIRO when they modelled the effects of climate change.

This must be taken into account for all water planning decisions and projects.

## 2. The Victorian government's water plan

The government's Water Plan, labelled as "Our Water Our Future" details the following key initiatives:

1. A new desalination plant for Melbourne
2. Modernising Victoria's Food Bowl irrigation system to capture lost water for farms, the environment and Melbourne
3. Expansion of Victoria's Water Grid
4. Upgrading Melbourne's Eastern Treatment Plant to provide over 100 GL of recycled water in 2012 and assessing a range of alternative uses of this water
5. Supporting new and existing water conservation programs for homes and industry.

### 2.1. The Wonthaggi desalination plant

The proposed desalination plant at Wonthaggi is planned to provide 150 gigalitres of water per year – enough for one third of Melbourne's consumption. However, this plant will require at least 90 megawatts of power to run. This translates to 1 terawatt hour per year (1,000 gigawatt hours).

The government has stated that they will source renewable energy for this, but there is significant risk that they won't be able to get enough.

Premier John Brumby stated on ABC Radio 774 on 26 June 2008 that the desalination plant would cost less to install and use less energy than installing

domestic rainwater tanks with electric pumps. The information he based this claim on appears to be incorrect. Calculations on domestic pumps supplying one million households indicated that they would only consume 365 gigawatt hours per year, less than half the amount required to power the desalination plant.

Subsequent measurements of the power consumption of our domestic water tank which supplies our entire water needs put the power consumption for 600,000 households at around one fifteenth that of the desalination plant.

**Reference:** [http://www.greenlivingpedia.org/Water\\_tank\\_pump](http://www.greenlivingpedia.org/Water_tank_pump)

More energy (and carbon emissions) is also needed to pump water from the desalination plant to Melbourne.

### **Recommendation**

- That the Wonthaggi desalination plant not be built

## **2.2. Modernising Victoria's irrigation system**

This \$750 million project is part of a government water strategy, which would also modernise infrastructure in the region to save 225 billion litres of water now lost through evaporation, seepage and system inefficiencies.

While replacing fixing leaks and water losses in irrigation infrastructure is a good thing, the Victorian government has announced a plan to pump water from the Goulburn River, which is in the water-deprived Murray Darling catchment, over the Great Dividing Range to Melbourne.

The problems with this are:

1. There is not enough water in the Goulburn River to take more out without critically endangering both the Goulburn and Murray Rivers. Audits have not confirmed that significant quantities of water are available for Melbourne.
2. The water taken out, estimated to be 75 gegalitres, will be pumped over the Great Dividing Range to Melbourne, which will result in more carbon emissions

### **Recommendation**

- No water should be pumped from the deprived Goulburn Murray Darling system to Melbourne.
- That the Goulburn to Melbourne pipeline not be built.

## 2.3. Expansion of Victoria's Water Grid

The concept behind "expanding the water grid" is to provide interconnections between river systems and storages across the state of Victoria.

The claimed benefits for this include:

- Increase the security of water supplies by diversifying the sources of water available for communities connected by the Grid
- Enable water to be traded more readily, by making it easier to transfer water to where it is most needed and valued
- Increase the value of supply options (current and future) by increasing the flexibility and diversity of uses.
- The expanded Victorian Water Grid will allow more water to be transferred between water systems.

However, around 10,000km of expensive new pipeline is required to create this network.

There are social equity issues with taking scarce water from rural areas to for Melbourne's domestic water supply.

Environmental flows have not been provided to the Yarra River, which flows through Melbourne, contrary to scientific recommendations and a previous government commitment. This environmental flow should be provided to ensure the health of the river.

Carbon emissions are generated every time water pumped through a pipeline unless renewable energy is used for this.

### Recommendations

- Pumping of water across regions should be a last resort measure.
- That environmental flows be restored to the Yarra River.

## **2.4. Upgrading Melbourne's Eastern Treatment Plant**

It is proposed to upgrading Melbourne's Eastern Treatment Plant to provide over 100 GL of recycled water in 2012 and assessing a range of alternative uses of this water

This proposal is a good one. However, Melbourne produces around 320 GL of wastewater per year. Around 400ML per day is pumped out from Gunnamatta Beach outfall alone.

### **Recommendations:**

- The government should set a higher target for recycling water of at least 200GL, and eliminate ocean outfalls.
- Latrobe Valley power stations consume 140 billion litres (GL) of water per year; so recycled water could be used for this purpose rather than drinking water.

## **2.5. Supporting new and existing water conservation programs for homes and industry**

This initiative is commendable. However, Melbourne's daily water usage is still quite high at 277 litres per person per day. A reduction to 150 litres per person per day is achievable, which would greatly reduce demand for water, and expensive new infrastructure to provide it.

## **3. Increased conservation and efficiency efforts**

The trends in Melbourne's water usage (daily litres per person) :

- 2007: 277 litres
- 2006/07: 303 litres
- 2005/06: 330 litres
- 1990s: 422 litres
- 1945/46: 300 litres

**Reference:** [http://www.greenlivingpedia.org/Melbourne\\_water\\_usage](http://www.greenlivingpedia.org/Melbourne_water_usage)

Residents of Brisbane and southeast Queensland have been limited to 140 litres per person a day since May 2007.

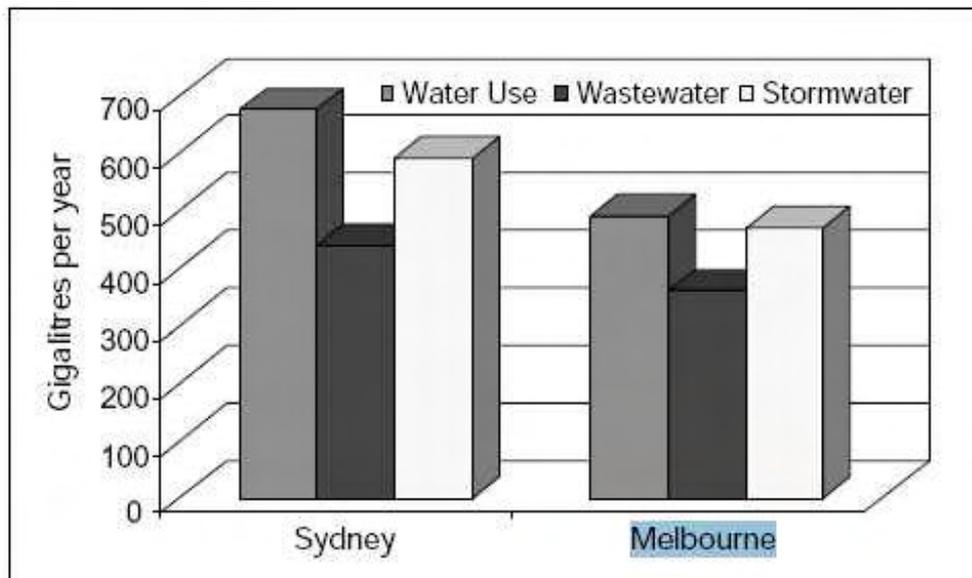
There is an opportunity to introduce further water efficiency measures in Melbourne and Victoria to achieve similar lower consumption figures to those achieved in southeast Queensland. This would save over 150 gigalitres of water use in Melbourne.

### **Recommendation**

- Set a goal of 140 litres per person a day water usage for Melbourne.

## 4. The collection of stormwater;

There are excellent opportunities for local collection and use of stormwater in both residential rainwater tanks and new larger suburban storage facilities.



**Source:** *The Reuse Potential Of Urban Stormwater And Wastewater Industry Report* (PDF), Grace Mitchell, Russell Mein, Tom McMahon

Stormwater runoff in Melbourne nearly exceeds Melbourne's water consumption; so increased use of stormwater would provide valuable additional supplies of water.

For example, our house in Surrey Hills has 23,500 litres of water storage that provides over 95% of our total water requirements. This has been in use since 2001, during which time the tanks have only been topped up with Melbourne water on three occasions. Even with reduced rainfall patterns, there is usually enough rain to keep the tanks supplied with water.

If 600,000 households reduced their consumption to our level and had equivalent water tanks, this would equate to savings of approximately 160 gigalitres of water. At \$5,000 per house this would equate to \$3b. For a similar cost to the proposed Wonthaggi desalination plant we could get more water from domestic water tanks with a greatly reduced carbon emissions.

### Recommendations

- Include a requirement in the building standards for 5,000 litres of water storage for each bedroom of new houses and for renovations
- Establish a rebate system to encourage retrofitting of water tanks to existing properties

## **5. The re-use of treated waste water**

Wastewater output from Melbourne is very high at around 300 gegalitres per year. Some of this water is output and Gunnamatta beach with significant environmental impact.

Maximum reuse of treated wastewater should be achieved without vehicle transport of the water.

### **Recommendations**

- Establish a “third pipe system” to bring recycled water to points of usage (e.g. sporting ovals, car washes etc)

## **6. The use of groundwater**

Groundwater is a finite resource that can be rapidly depleted, which can cause reductions in water supplies in connected river systems.

### **Recommendations**

- Aquifers that are pumped for groundwater must be monitored
- If levels deplete significantly, pumping should cease until the aquifer recovers.

## **7. Small locally based desalination plants**

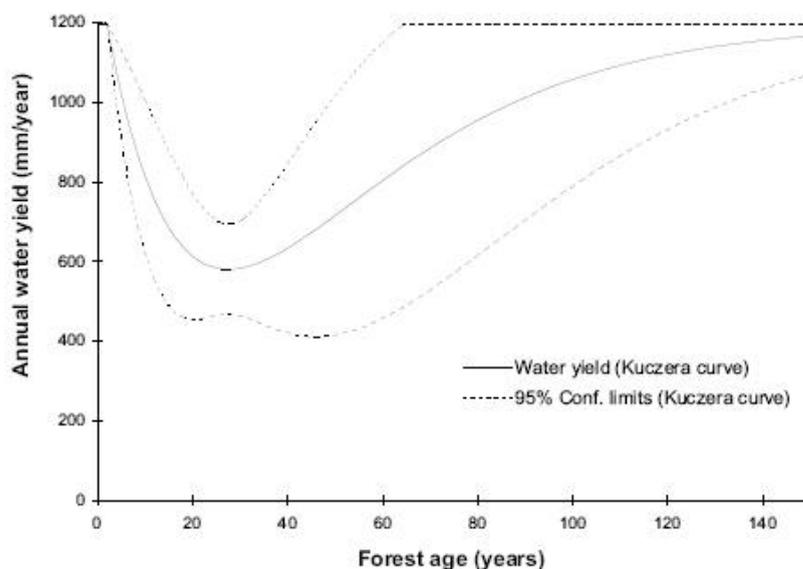
Desalination plants require a lot of energy to run. In addition, pumping water from them requires further energy. The capital costs of building desalination plants (even small local ones) are very high, as are the operating costs.

### **Recommendations**

- Desalination plants should be the last resort for water supplies.
- Stormwater and treated wastewater use measures should be used in preference to desalination.
- Locally based stormwater storage facilities should be constructed rather than desalination plants.

## 8. Stopping logging in water catchments

The water supply of the city of Melbourne is sourced from mountainous forests to the city's northeast. These forests, which are 50% occupied by the eucalypt species Mountain Ash, yield more water when the forests are older than about 50 to 100 years. This is because evapotranspiration (ET) from older forests is lower per unit area than from younger forests.



Annual water yield versus forest age (Kuczera Curve) from Watson et al. (1999)

The Kuczera curve predicts a decline in water yield immediately after clearing, leading to a minimum at about 20 to 30 years, followed thereafter by a gradual rise back toward 'old-growth' water yield at about 100 years of age.

Around 12% of the Melbourne's total forest catchment is available for logging and 340 hectares can be harvested each year. Clear felling occurs in five catchments which supply approximately 40% of Melbourne's water needs.

In May 2002, the Victorian Government released the "21st Century Melbourne: a WaterSmart City" report. The vast majority of public submissions for this study favoured stopping logging in all water supply catchment areas. The report contained a recommendation to "conduct a detailed and comprehensive investigation into the feasibility of establishing plantations to allow for the phasing out of logging in Melbourne's water supply catchments". The report further stated that "if plantation alternatives are confirmed feasible, an implementation plan to phase out logging from within the catchments should be prepared".

Potential water savings from the gradual phasing out of logging in the Thomson catchment alone by 2020 were estimated in the report to provide an additional 20 gigalitres (20,000 ML) per year of water in 2050.

In June 2004, the government released another report titled "Securing Our Water Future Together" which stated, "*Melbourne's original water catchments are closed catchments, are managed as national parks and that logging will continue to be banned in those catchment areas*".

This report also found that "*improved water yields within catchments supplying water to Melbourne are important in securing Melbourne's water supplies*".

Actions identified for government included developing options to phase out logging in the water catchment areas, transition the wood supply to plantations, and assess the social and environmental benefits and costs of these options.

### **Recommendations**

- Immediately cease all logging in Melbourne's designated water catchments, yielding up to 30 gigalitres of additional water per year.

## **9. Restrict filling of swimming pools to rainwater only**

Domestic swimming pools cannot currently be filled from Melbourne's water supply.

Consequently, pools are filled by tankers that bring water from bores some distance away, which results in significant carbon emissions for the pumping and transport.

### **Recommendation**

- Mandate that domestic swimming pools can only be filled from local rainwater tank supplies

## 10. Summary

Current projects to address Victoria's water shortage, with a particular focus on ensuring Melbourne's water supply, will have severe impacts on rural areas.

In particular, the loss of water from the ailing Goulburn River, and the building of an energy hungry and polluting desalination plant at Wonthaggi will have major impacts to these regions. In addition, carbon emissions from both will further exacerbate climate change.

The entire Murray Darling River is now at risk. Rather than taking more water from the Goulburn River, increased environmental flows should be provided to both the Goulburn and Murray rivers.

The \$4.9b spending on these water projects will be passed onto Victorian taxpayers, with water bills increasing by about 15% already in 2008. It is projected that water prices will double by 2012 to pay for these projects.

Costly and polluting desalination plants, either large scale or distributed, are not currently required – they should be the last resort for water production.

Melbourne's water supply needs would be better and more cheaply met by:

- Reducing water consumption through increased efficiency measures (over 150GL savings per year)
- Stopping logging in water catchments (around 30GL savings per year)
- Major investment in domestic water tank systems, which have the added advantage of being installed incrementally (in excess of 160GL savings per year)
- Harvesting, storing and using more of the 450 GL of storm water Melbourne loses per year (possible savings of an additional 200GL per year)
- Recycling at least 200GL of sewerage per year and stopping ocean outfalls. (200GL savings per year)

These initiatives can be funded from recurrent spending at cheaper rates (10%) than funds for giant projects such as the proposed \$3b desalination plant (20%) under a Public Private Partnership.