

General Purpose Standing Committee No. 5

# **A sustainable water supply for Sydney**

Ordered to be printed according to the Resolution of the  
House

New South Wales Parliamentary Library cataloguing-in-publication data:

**New South Wales. Parliament. Legislative Council. General Purpose Standing Committee No. 5**

A sustainable water supply for Sydney : [report] / General Purpose Standing Committee No. 5. [Sydney, N.S.W.] : The Committee, 2006. – 175 p. ; 30 cm. (Report ; no. 25)

Chair: Ian Cohen.

“Ordered to be printed”.

“June 2006”.

ISBN 0734764715

1. Water supply—New South Wales--Sydney.
  - I. Title.
  - II. Cohen, Ian.
- III. Series: New South Wales. Parliament. Legislative Council. General Purpose Standing Committee No. 5. Report ; no. 25

DDC 333.91099441

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## Terms of Reference

That General Purpose Standing Committee No. 5 inquire into and report on a sustainable water supply for Sydney and, in particular:

- a. The environmental impact of the proposed desalination plant at Kurnell
- b. The environmental assessment process associated with the proposed desalination plant
- c. Methods for reducing the use of potable water for domestic, industrial, commercial and agricultural purposes, including sustainable water consumption practices
- d. The costs and benefits of desalination and alternative sources of water including recycled wastewater, groundwater, rainwater tanks and stormwater harvesting
- e. Practices concerning the disposal of trade waste
- f. The tender process and contractual arrangements, including public-private partnerships, in relation to the proposed desalination plant and
- g. Any other relevant matter.

*(These terms of reference were self-referred by the Committee on Thursday, 1 December 2005)*

## Committee Membership

|                                       |                        |                     |
|---------------------------------------|------------------------|---------------------|
| <b>Mr Ian Cohen MLC</b>               | The Greens             | <i>Chair</i>        |
| <b>The Hon Rick Colless MLC</b>       | The Nationals          | <i>Deputy Chair</i> |
| <b>The Hon Greg Donnelly MLC</b>      | Australian Labor Party |                     |
| <b>The Hon Patricia Forsythe MLC*</b> | Liberal Party          |                     |
| <b>Ms Sylvia Hale MLC</b>             | The Greens             |                     |
| <b>The Hon Peter Primrose MLC**</b>   | Australian Labor Party |                     |
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\* Substituting for the Hon Don Harwin MLC

\* Substituting for the Hon Tony Catanzariti MLC

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## Chair's Foreword

General Purpose Standing Committee No 5 adopted this inquiry on Thursday, 1 December 2005. The inquiry was adopted primarily in response to the Government's decision to construct a desalination plant at Kurnell in Sydney's south, as announced by the former Premier, the Hon Bob Carr MP, on 8 May 2005.

The Committee advertised its terms of reference in December 2005. In response, the Committee received 136 submissions from interested individuals, academics, local councils, government departments and private companies.

Subsequently, on 8 February 2006, the Premier, the Hon Morris Iemma MP, announced that construction of the desalination plant at Kurnell had been deferred indefinitely. Construction is now dependent upon Sydney's water supply falling to 30% of dam capacity.

I saw this change as an opportunity for the Committee to continue its inquiry and investigate broader issues of water management in Sydney, also raised in the Committee's terms of reference. It resulted in a valuable and cooperative process which will hopefully shed light on future sustainable strategies for Sydney. Accordingly, the Committee proceeded with three public hearings on 10, 20 and 23 March 2006, together with two site visits on 22 May 2006.

I would like to take this opportunity to thank all of the many participants in the inquiry – those who made written submissions and those who gave their valuable time to talk to the Committee during its public hearings and site visits. The value and quality of these contributions was very high.

Thanks also to my fellow Committee Members for their commitment to this inquiry and for setting the inquiry's direction and focus.

I would also like to thank the members of the Committee Secretariat who worked on this inquiry for their research assistance and coordination of the Committee's hearings and site visits: John Young, Victoria Pymm, Stephen Frappell and Glenda Baker. Thanks also to Hansard reporters who recorded proceedings at the Committee's hearings.



**Mr Ian Cohen MLC**  
**Chair**

## Executive Summary

Historically, Sydney's water supply has relied upon capturing rainfall and storing it in dams. This system has in the past provided a relatively secure and stable water supply for Sydney. However, recent periods of drought and rates of consumption have seen storage levels fall to below 40% of capacity. At the time this report was tabled, storage levels were at approximately 42% of capacity.

This reduction in Sydney's water catchments in recent years has brought the issues of better and more sustainable water management for Sydney into sharp relief. While there is no doubt that Sydney's traditional approach of capturing water in the Hawkesbury-Nepean and Shoalhaven systems, using it once and then disposing of it at sea has been economically and socially advantageous, it is becoming increasingly clear that it is no longer environmentally sustainable. More sophisticated and environmentally friendly water management practices need to be adopted.

The Committee's findings are summarised below.

### The desalination plant

The Committee believes that if the Government adopts good water management practices, the likelihood of Sydney ever needing a desalination plant is small. The February 2006 Progress Report on the Metropolitan Plan notes that Sydney is now in a position to secure its water supplies in the face of severe drought and even potential climate change impacts and has more than enough water to meet its normal growth needs for at least the next 10 years. Accordingly, the Committee majority believes that while planning for the possible construction of a desalination plant continues, it should no longer be designated critical infrastructure under section 75C of the *Environmental Planning and Assessment Act 1979*. The removal of this classification would allow the preparation of a full Environmental Impact Statement on the proposed desalination plant.

The Committee majority also believes that given the deferral of the construction of the desalination plant, there is now an opportunity to investigate other issues related to the plant such as the possible co-location of a power plant and the impact of seawater concentrate discharges from the desalination plant on water quality and aquatic ecology.

### The supply of water to Sydney

The Committee believes that there are clearly opportunities for Sydney to reuse wastewater that would have previously been discharged into the environment, thereby greatly enhancing the sustainability of Sydney's water supply. While potable reuse of water through return of treated water to Warragamba Dam is an option, the energy and piping costs make this option undesirable. Rather, the greater opportunity for reuse of wastewater is in the area of recycling for industrial and agricultural use. The Committee cites the water reclamation and management scheme at Sydney Olympic Park and the Rouse Hill water recycling project as outstanding examples of non-potable water reuse. The Committee also encourages Sydney Water and local government to continue to expand and improve their stormwater management initiatives, including the installation of rainwater tanks.

### The demand for water in Sydney

The current cost of water to Sydneysiders does not reflect its value as a scarce and essential resource. Traditionally, water has been supplied to Sydney consumers at a fixed cost, regardless of usage levels.

However, the Committee believes that the Independent Pricing and Regulatory Tribunal should continue down its current path of pricing water to reflect rates of usage. User pays pricing of water would be further encouraged through the development of accounts and bills for consumers that indicate water usage relative to other households in the community and by the individual metering of water usage by occupants of high density housing. The Committee recognises that greater user-pay pricing of water may necessitate appropriate subsidies or other forms of assistance for the economically vulnerable.

Sydney Water is also managing domestic household demand through ongoing water restrictions and various programs such as the Indoor Waterfix Program and Rainwater Tank Rebate Program. In addition, businesses and local councils are being encouraged to save water through Sydney Water's Water Saving Fund. Government agencies have also committed to targeted reductions in water use. However, despite these initiatives, the Committee notes that Sydney Water in 2004/2005 exceeded its operating targets for water consumption from the Sydney Catchment Authority. Clearly, Sydney Water needs to continue to focus on ongoing water demand management.

### **Trade waste**

Sydney Water has developed a trade waste policy and acceptance standards for controlling the amount and concentration of trade waste discharged into the sewerage system. This is aimed at minimising the high levels of nitrogen, phosphorous and other harmful chemicals being discharged into the environment.

The Committee recognises that Sydney Water is rightly concentrating its water recycling efforts on Western Sydney, where there is greater capacity for recycling water for irrigation and other agricultural purposes and less capacity for the Hawkesbury-Nepean River to absorb effluent. However, in the long-term, the Committee majority believes that Sydney Water should look to decrease the amount of effluent being discharged through Sydney's current system of ocean outfalls, while at the same time bringing the level of treatment of that effluent up to a higher level than the current standard with the aim of further reducing toxic and chemical plumes in the receiving ocean environment.

### **The ecological health of the Hawkesbury-Nepean and Shoalhaven Rivers**

It is becoming increasingly clear that Sydney's traditional approach of capturing large amounts of water in dams such as the Warragamba and Tallowa to supply water to greater Sydney entails significant environmental costs. During recent periods of drought, environmental flows of water down the Shoalhaven and Hawkesbury-Nepean Rivers have been severely curtailed. This has in turn led to significant outbreaks of algal blooms, weed contamination and decimation of marine species.

The Committee notes that the Government's 2006 Water Management Plan, like the 2004 plan, foreshadows the development and implementation of a water sharing plan for the Sydney region. The Committee believes that finalisation of a water sharing plan for both the Hawkesbury-Nepean and Shoalhaven systems, including adequate environmental flows, is a matter of urgency.

### **The future of water management in Sydney**

The Government has made a commitment to long-term planning for Sydney's water management through the Metropolitan Water Plans, including a commitment to regular major reviews of the existing plan every four years. The Committee welcomes this process, but emphasises the need for future water

management proposals for Sydney to take into account the full range of economic, social and environmental impacts, rather than simply the economic bottom line.

Water planning for Sydney's future is now incorporating other options such as large-scale water recycling schemes, measures to conserve water in households and industry, greywater recycling in homes and reuse of stormwater.

## Summary of Recommendations

- Recommendation 1** 46  
That Sydney Water institute a regular liaison and information sharing process with the local councils and community groups near the Kurnell desalination plant site.
- Recommendation 2** 47  
That the Minister for Planning remove the critical infrastructure status from the Kurnell desalination project.
- Recommendation 3** 47  
That the Government commit to developing additional green energy generation capacity equal to the demand of the desalination plant, if it is ever built.
- Recommendation 4** 48  
That Sydney Water develop, undertake and include in the Environmental Assessment (or replacement document) further analysis on the impact of seawater concentrate discharges on water quality and aquatic ecology.
- Recommendation 5** 49  
That, as part of the planning process for the desalination plant, Sydney Water undertake and report on opportunities for accepting and making use of waste water from nearby industrial plants.
- Recommendation 6** 76  
That Sydney Water consider utilising further housing developments to replicate the success of the water recycling project at Rouse Hill.
- Recommendation 7** 76  
That Sydney Water consider a different structure of incentives for households that choose to install a rainwater tank, including subsidised professional instalment and maintenance costs.
- Recommendation 8** 77  
That Sydney Water continue to develop its Active Leakage Reduction program and publish estimates of both the number of leaks in the system and their subsequent reduction.
- Recommendation 9** 77  
That Sydney Water develop transparent measures through which to weigh the costs and benefits to the community of private involvement in water reuse initiatives.
- Recommendation 10** 93  
That, during its next round of deliberations, the Independent Pricing and Regulatory Tribunal consider altering the price structure of water further in favour of variable costs over fixed ones. This may require the Government to investigate appropriate subsidies or other forms of assistance for the economically vulnerable.

- Recommendation 11** **93**  
 That Sydney Water produce a quarterly water bill that informs consumers of their water costs compared to the average consumed by similar households in the community, based on the national guidelines currently being developed by the Council of Australian Governments.
- Recommendation 12** **93**  
 That the Government expand and diversify its current community education campaigns to inform the community of the value of continuing commonsense and practical water conservation behaviours even in non-drought times.
- Recommendation 13** **94**  
 That Sydney Water allocate revenue from the sale of water over and above the water saving operating targets to the Water Savings Fund.
- Recommendation 14** **94**  
 That the NSW Department of Planning continue to monitor the success of the Building Sustainability Index, with a view to technological progress and the potential for the Building Sustainability Index to be expanded.
- Recommendation 15** **95**  
 That Sydney Water trial individual household water readings in high density housing, if possible in conjunction with simultaneous reading of gas and electricity meters, and that a cost benefit analysis of this trial be undertaken.
- Recommendation 16** **112**  
 That the Department of Natural Resources, as a matter of urgency, finalise the water sharing plan for the Sydney region, including allocations of environmental flows to the Hawkesbury-Nepean and Shoalhaven Rivers.
- Recommendation 17** **112**  
 That the Department of Natural Resources ensure that adequate environmental flows are restored to the Hawkesbury-Nepean River, in line with a finalised water sharing plan for the Sydney region.
- Recommendation 18** **113**  
 That the Department of Natural Resources ensure that adequate environmental flows are restored to the Shoalhaven River, in line with a finalised water sharing plan for the Sydney region.
- Recommendation 19** **113**  
 That the Government undertake a cost/benefit analysis of installing renewable energy resources to match the amount of electricity used to transfer water from the Shoalhaven to the Nepean and Warragamba Dams.
- Recommendation 20** **122**  
 That the Government apply a broader cost benefit analysis of the economic, social and environmental costs and benefits of water management options when developing Sydney's future Metropolitan Water Plans.

**Recommendation 21**

**123**

That the recommendations of the Metropolitan Water Independent Review Panel on all metropolitan water planning matters be made publicly available, together with a response from Sydney Water.

**Recommendation 22**

**123**

That Sydney Water and the Metropolitan Water Independent Review Panel engage with local councils when consulting on metropolitan water planning strategies for Sydney.

## Glossary

|           |  |
|-----------|--|
| AGL       | Australian Gas and Light Company   |
| BASIX     | Building Sustainability Index  |
| DEC       | Department of Environment and Conservation   |
| DoP       | Department of Planning   |
| EA        | The Environmental Assessment of the Concept Plan for Sydney's Desalination Project |
| EIS       | Environmental Impact Statement   |
| EP& A Act | <i>Environmental Planning and Assessment Act 1979</i>                              |
| gigalitre | 1 billion litres   |
| IPART     | Independent Pricing and Regulatory Tribunal  |
| megalitre | 1 million litres (ML)  |
| NWC       | National Water Commission  |
| NWI       | National Water Initiative  |
| PFM       | Planning Focus Meeting   |
| PPR       | Preferred project report   |
| ppt       | parts per thousand   |
| SCA       | Sydney Catchment Authority   |



# Chapter 1 Inquiry conduct

This Chapter provides an overview of the inquiry process and the structure of this report. It also provides a brief background to the context in which this inquiry arose.

## Terms of reference

- 1.1 The inquiry terms of reference were adopted on 1 December 2005, under the Committee's power to make a self-reference. They are reproduced on page iv of this report.

## Submissions

- 1.2 The Committee called for submissions through advertisements in the *Sydney Morning Herald*, the *Daily Telegraph* and Sydney suburban newspapers. The Committee also wrote to individuals and organisations with a likely interest in the inquiry, including green groups, local governments and academics with specialty in water research and community groups.
- 1.3 The Committee received a total of 136 submissions from a range of stakeholders, including interested individuals, academics, local councils, government departments and private companies. A list of all submissions is contained in Appendix 1. A number of the public submissions may be accessed via the Committee website at [www.parliament.nsw.gov.au/gpscno5](http://www.parliament.nsw.gov.au/gpscno5).

## Water conference

- 1.4 The Australian Water Summit Sydney 2006 was held at the Sydney Convention and Exhibition Centre on 13 and 14 March. As the themes of this summit were pertinent to the terms of reference of this inquiry into a sustainable water supply for Sydney, the Chair and Deputy Chair of the Committee and a secretariat staff member attended the conference on both days.
- 1.5 The Australian Water Summit increased the Committee's knowledge and understanding of Australian water resources and provided the Committee with a valuable insight into the need for and delivery of integrated water management systems.

## Public Hearings

- 1.6 The Committee held a total of three public hearings during this inquiry on 10, 20 and 23 March 2006. All hearings were held at Parliament House. A list of the witnesses is provided in Appendix 2 and transcripts of the public hearings can be found on the Committee's website at [www.parliament.nsw.gov.au/gpsc5](http://www.parliament.nsw.gov.au/gpsc5). A list of the documents tabled during the hearings may be found in Appendix 3.
- 1.7 The Committee would like to thank all of the people who participated in the inquiry, whether by making a submission, giving evidence or attending the public hearings.

## Site visits

- 1.8** On 22 May 2006, the Committee travelled to Sydney Olympic Park and to Rouse Hill Recycled Water Plant to gain further insight into water recycling projects being undertaken in Sydney.
- 1.9** At Sydney Olympic Park, Mr Brian Newman, CEO of Sydney Olympic Park Authority and Mr Andrzej Listowski, Senior Manager, Water and Energy Sydney Olympic Park Authority, informed the Committee of the water reclamation and management scheme used for Sydney Olympic Park and conducted a tour of the integrated sewage treatment and water reclamation facilities at the site.
- 1.10** At Rouse Hill Recycled Water Plant, the Committee was briefed by Mr David Evans, the Managing Director of Sydney Water and Ms Yvonne Sinanovic, Plant Manager, before a tour of the sewage treatment and recycled water mechanisms.

## Inquiry background

- 1.11** Over recent years the supply of water for the greater Sydney area has become a major issue. Coupled with ongoing severe drought conditions that have significantly lowered the levels of water supply storages throughout the catchment, Sydney's population has increased to the point where demand for water now exceeds the long-term sustainable supply.<sup>1</sup>
- 1.12** The supply of water to the population of greater Sydney is the responsibility of two separate government departments – the Sydney Catchment Authority supplies bulk water to Sydney from dams and other infrastructure, while Sydney Water is responsible for the filtration and delivery of potable water as well as the transportation and treatment of wastewater.<sup>2</sup>
- 1.13** In response to concerns relating to the sustainability of Sydney's water supply, the then NSW Premier, the Hon Bob Carr MP, announced on 8 May 2005 the Government's intention to construct a desalination plant at Kurnell in Sydney's south. This raised public awareness of water issues in general and concerns in relation to the desalination plant in particular and was the catalyst for this inquiry.
- 1.14** On 8 February 2006, during the course of the Inquiry, the Premier, the Hon Morris Iemma MP, announced that construction of the desalination plant at Kurnell would only begin if dam storage levels dropped to 30%. Nonetheless, the inquiry continued to look at not only the proposal to build the desalination plant but also water management and water saving initiatives raised by parties to the inquiry.
- 1.15** Accordingly, this report relates not only to desalination and the plant at Kurnell but also to the long-term sustainable management of Sydney's water supply.

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<sup>1</sup> Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region: Final Report*, October 2005, p1

<sup>2</sup> Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region: Final Report*, October 2005, p2

## Report Outline

1.16 This report is in eight chapters:

- Chapter 2 looks at the background to this inquiry and the trends in rainfall that are affecting the sustainability of Sydney's water supply.
- Chapter 3 examines the proposal for the construction of a desalination plant at Kurnell, including the environmental assessment of the project.
- Chapter 4 considers the supply of water to Sydney, options to increase it such as recycling and means of decreasing the amount of potable water used for purposes other than drinking such as recycling.
- Chapter 5 looks at demand for water in Sydney and means of reducing demand.
- Chapter 6 examines Sydney Water's management of trade waste.
- Chapter 7 studies the ecological health of the Hawkesbury-Nepean and Shoalhaven Rivers and the impact on both systems of damming and extraction of water to supply the Sydney population.
- Chapter 8 examines the future management of a sustainable water supply for Sydney.

## Chapter 2      **Background to Sydney's water situation**

Maintaining a reliable water supply has always been a vital issue in the development and prosperity of Sydney. The current prolonged drought and Sydney's increasing population have exacerbated this intrinsic problem.

### **Sydney's existing water supply**

- 2.1** Traditionally, metropolitan Sydney's water supply has relied on capturing rainfall and storing it in dams. The system that provides those water supplies includes 11 major dams, storing 2,600 gigalitres of water.<sup>3</sup> This storage capacity is much larger, per capita, than many other cities in the world, a factor of the variable amount of rainfall in Sydney's catchment area and the limited availability of other sources, such as groundwater and melted snow.<sup>4</sup>
- 2.2** Historically, Sydney's system of dams has provided a relatively secure, stable supply of water to Sydneysiders. The completion of Warragamba Dam in 1960 and the Shoalhaven Scheme in 1977 have provided Sydney with a relatively 'cheap and bountiful' supply of water, although significant environmental damage is now being identified as a consequence of these systems.<sup>5</sup>
- 2.3** However, the current drought has significantly reduced the amount of water stored in the dams supplying Sydney. Water storage levels dropped to 37.9% in 2005.<sup>6</sup> As of 1 June 2006, storage levels were at 41.7%.<sup>7</sup>

### **Sydney's future water supply**

- 2.4** The Committee notes that a number of factors influence Sydney's future demand for and supply of water. These are examined below.

#### **Global warming and rainfall trends**

- 2.5** The Committee notes that there is an established trend of global warming that is reflected across Australia. This trend has seen a consistent rise in Sydney's daytime maximum temperatures and overnight minimum temperatures, with a decrease in the number of extreme cold days and nights.<sup>8</sup>

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<sup>3</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p2

<sup>4</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p2

<sup>5</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p4

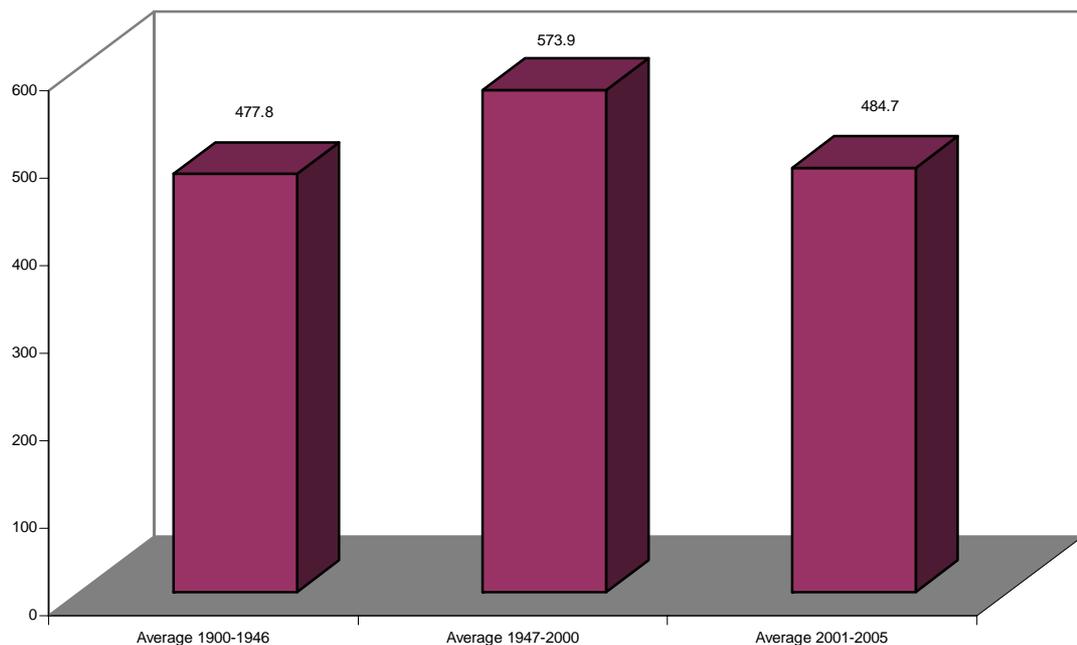
<sup>6</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p19

<sup>7</sup> Sydney Catchment Authority website <[www.sca.nsw.gov.au](http://www.sca.nsw.gov.au)> (accessed 18 May 2006). The Committee notes that on 15 April 2006, the Sydney Catchment Authority completed its project to access deep water storage at Warragamba Dam, substantially increasing the volume of water available from the Dam. As a result, the figures from 2005 and 2006 cited are not directly comparable.

<sup>8</sup> Mr Lellyett, Evidence, 23 March 2006, p57

**2.6** However, while changes in temperature have been consistent and can be charted, the same cannot be said about rainfall. Nonetheless, evidence presented to the Committee by the Bureau of Meteorology suggests that there has been a distinct change in Sydney's rainfall patterns over the past century. The figure below provides a general overview of rainfall patterns over the last 100 years.

**Figure 2.1: NSW average rainfalls for 1900-1946 and 1947-2000 compared to 2001-2005**



Source: Tabled document, Australian Bureau of Meteorology data, 23 March 2006

**2.7** Mr Stephen Lellyett, Deputy Regional Director (NSW) of the Bureau of Meteorology, told the Committee that there is insufficient data to be confident to predict the trend in rainfall patterns in the future. However, he noted that in the past eight years there has been a 'generalised drying trend with rainfall, cumulative rainfall totals that are in ... the lowest 10 percent or 20 to 30 percent on record for a sustained period of time'.<sup>9</sup> Mr Lellyett also noted that:

There have been some other unusual phenomena in the last 10 years or so. There have been a few El Niños in close succession, which typically bring drought to eastern Australia, and we have also seen probably the eight or nine hottest years on record.<sup>10</sup>

**2.8** As outlined in the Metropolitan Water Plan 2006, the potential impacts of climate change on Sydney's water supply include:

- higher temperatures

<sup>9</sup> Mr Lellyett, Evidence, 23 March 2006, p58. The Committee notes that the deep water storage project was completed on 15 April 2006, when a water supply access point was created at the base of Warragamba Dam. This access has increased the capacity of the Dam. [www.sca.nsw.gov.au/dams/deepwater/faqs](http://www.sca.nsw.gov.au/dams/deepwater/faqs)

<sup>10</sup> Mr Lellyett, Evidence, 23 March 2006, p59

- changed rainfall patterns
- increased evaporation (which will increase evaporative losses from the system and reduce the amount of run-off that flows into the system)
- longer and more intense droughts.<sup>11</sup>

**2.9** The Metropolitan Water Plan 2006 also noted that while the amount of rainfall in Sydney is more on average than London, the rainfall patterns are highly variable, with some periods of prolonged drought and others of excess precipitation. Therefore, the Government must prepare for the possibility of prolonged and severe drought across all of the catchment areas.<sup>12</sup>

### **Drought or dam reduction**

**2.10** In the Metropolitan Water Plan 2006, the term drought is defined as ‘a period of time when the water stored in the reservoirs, plus anticipated or forecast inflows, is considered to be insufficient to meet current or future unrestricted demand...’<sup>13</sup> Over the last 120 years, Sydney has experienced three severe droughts – the current drought is only second in severity to the drought which occurred in the 1940s, which instigated the building of Warragamba Dam.<sup>14</sup>

### **Population increase**

**2.11** Population increase is another of the key factors affecting the demand on water resources. The Government estimates that Sydney is currently growing by around 40,000 people per year. It is predicted that this trend will continue.<sup>15</sup>

### **Water consumption**

**2.12** It is estimated that Sydney currently consumes 400 litres of water per capita per day, most of which is attributed to residential use.<sup>16</sup>

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<sup>11</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p27

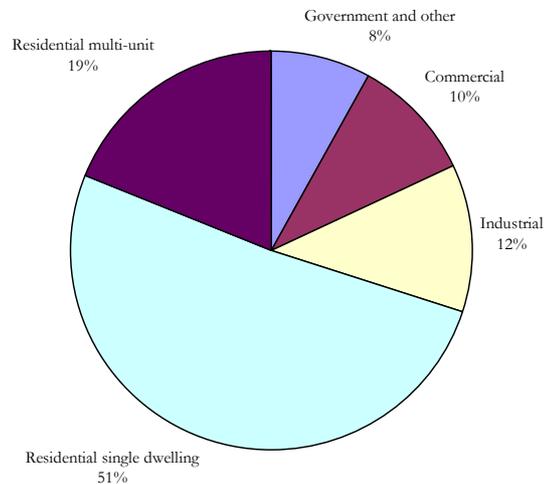
<sup>12</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p80

<sup>13</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p18

<sup>14</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p18

<sup>15</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p4

<sup>16</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p4

**Figure 2.2: Sydney Water customer water use in 2004-2005**

Source: Sydney Water Corporation, Water Conservation and Recycling Implementation Report 2004-2005, Summary, pii

**2.13** The introduction to the May 2006 Metropolitan Water Plan states:

Sydney's current storage system could provide Sydney with four years of supply under zero inflow conditions.<sup>17</sup>

## National water management initiatives

**2.14** While water management is a state government responsibility, the need for the whole of Australia to manage better its water supply has stimulated the development of a national strategy. The National Guidelines and the body created to implement them, the National Water Commission, are outlined below.

### National Guidelines for water management<sup>18</sup>

**2.15** On 25 June 2004, the States and the Commonwealth Governments (with the exception of Tasmania, which has since signed and Western Australia, which has indicated it will sign shortly) signed the National Water Initiative (NWI).

**2.16** The NWI is aimed at developing a comprehensive, Australia-wide approach to water reform and management. Its objectives include increasing the productivity and efficiency of water use; ensuring the health of river and groundwater systems, including the establishment of clear

<sup>17</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p2

<sup>18</sup> National Water Commission website <[www.nwc.gov.au](http://www.nwc.gov.au)> (accessed 8 May 2006)

pathways to return all systems to environmentally sustainable levels of extraction; and recognising the need to service rural and urban communities.

**2.17** The National Water Commission (NWC) was created to implement the NWI framework. It is the role of the NWC, as an independent body, to monitor the performance of the states in meeting their NWI commitment.

**2.18** At the recent Australian Water Summit, Ken Matthews, the Chairman and CEO of the National Water Commission, outlined the Commission's work priorities for 2006:

- establish nationally compatible water accounting systems
- clarify water access entitlements
- develop effective water markets across Australia
- sponsor a clear shared understanding across Australia of sustainable water management
- further enhance the irrigation industry's efficiency and sustainability
- develop nationally consistent approaches to urban water resource planning that:
  - provide for effective community engagement
  - include robust assessment of options to expand water supplies
- encourage recycling and reuse of water, including community understanding.<sup>19</sup>

**2.19** As well as taking a supervisory role, the NWC is conducting a baseline assessment of Australia's water resources, including the entire availability of water in our systems (surface and groundwater), how water is being used and the environmental health of our river systems. This assessment has yet to be completed but will provide information essential for understanding our water resources, monitoring changes in them and assessing how best to manage them in the future.<sup>20</sup>

## **NSW Government water management initiatives**

**2.20** There are three key Government documents which provide a water plan for Sydney. These are:

- the Metropolitan Water Plan 2004
- the February 2006 Progress Report on the Metropolitan Water Plan
- the Metropolitan Water Plan 2006

**2.21** These three documents are briefly outlined below.

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<sup>19</sup> Mr Ken Matthews, Chairman and CEO, National Water Commission, *Presentation*, Australian Water Summit, Sydney, 13 March 2006

<sup>20</sup> Hon Malcolm Turnbull MP, Parliamentary Secretary to the Prime Minister, *Keynote speech*, Australian Water Summit, Sydney, 14 March 2006

## The Metropolitan Water Plan 2004

- 2.22** *Meeting the challenges - Securing Sydney's water future* (the Metropolitan Water Plan 2004) was released on 19th October 2004. The plan outlined a \$1.4 billion strategy aimed at ensuring Sydney's water future through optimising water supplies from the existing system, as well as ensuring that Government, industry and households reduce their water use to sustainable levels.<sup>21</sup> Further, the 2004 Plan aims to restore the health of the Hawkesbury-Nepean River, which has been damaged by significant flow diversion to boost Sydney's potable water supply.<sup>22</sup>
- 2.23** This 2004 Plan notes the requirement for re-evaluation of the different water management strategies over time, as more is known about the effects of climate change on the catchment area. As a result, it foreshadowed that the Plan would be revised every 5 years.<sup>23</sup>
- 2.24** The 2004 Plan discussed a number of options available to the Government to manage better water supplies. These included accessing deep water at the bottom of dams, increased transfers from the Shoalhaven River, using groundwater, desalination planning, recycling, reducing demand and increasing environmental flows to the Hawkesbury-Nepean river.
- 2.25** The aim of the 2004 Plan is to negotiate a balance between these options in order to supply Sydney with water over the next 25 years.<sup>24</sup>

## Review of the Metropolitan Water Plan

- 2.26** In response to Sydney's growing water shortage, the Government commissioned a review the Metropolitan Water Plan 2004 to be undertaken by Professor Stuart White of the Institute for Sustainable Futures at the University of Technology, Sydney and Mr David Campbell at ACIL Tasman.
- 2.27** In February 2006, the interim Review of the Metropolitan Water Plan was released, followed by the final report in April. The interim report showed how the supply-demand balance in 2015 could be met with rain-fed supply and a suite of demand management initiatives and how Sydney's water needs could be secured against the risk of severe drought by having the capacity to deploy groundwater and desalination. The final report incorporated analysis of the Government's more recent decisions to increased recycling, groundwater and desalination readiness in the case of severe drought.<sup>25</sup>

<sup>21</sup> Department of Infrastructure, Planning and Natural Resources, *Meeting the challenges – Securing Sydney's water future*, <[www.dipnr.nsw.gov.au/waterplan/](http://www.dipnr.nsw.gov.au/waterplan/)> (accessed April 2006)

<sup>22</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p2

<sup>23</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p3

<sup>24</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p26

<sup>25</sup> Institute for Sustainable Futures at the University of Technology, Sydney, ACIL Tasman, SMEC Australia, *Review of the Metropolitan Water Plan: Final Report*, April 2006, p5, <[www.waterforlife.nsw.gov.au/government/p/isf\\_acil\\_review\\_april06\\_final\\_1.pdf](http://www.waterforlife.nsw.gov.au/government/p/isf_acil_review_april06_final_1.pdf)> (accessed 20 May 2006)

- 2.28** The Review concluded that the overall position was positive in relation to the management of Sydney's water supply in the current drought and the ability for the proposed initiatives to allow the system to cope with future water demand and supply requirements.<sup>26</sup>

### **The February 2006 Progress Report**

- 2.29** Based on the findings of the above review, the February 2006 Progress Report updated the measures outlined in the Metropolitan Water Plan 2004 on the advice provided by the Review.<sup>27</sup> It outlined new independent analysis which showed that Sydney is in a position to secure its water supplies in the face of severe drought and has more than enough water to meet its normal growth needs for at least the next ten years.
- 2.30** In the Progress Report, the Government also committed to continuing investigations into groundwater reserves to be used as a supply source in severe droughts. It also announced that it would not be necessary to raise the Tallowa Dam wall, but that additional water could be sourced from the Shoalhaven system by changing operational management of the Dam.<sup>28</sup>

### **The Metropolitan Water Plan 2006**

- 2.31** In response to the advice of the expert panel of Professor Stuart White of the Institute for Sustainable Futures at the University of Technology, Sydney and Mr David Campbell of ACIL Tasman, the Premier released the Metropolitan Water Plan 2006 on 8 May 2006. The 2006 Plan updated the Government's water management strategy, including additional strategies to deal with the current drought, improved information concerning 'water availability and new water supply options'<sup>29</sup> and a new focus on regulatory issues including pricing and engaging the private sector.<sup>30</sup> The 2006 Plan emphasised the Government's commitment to adaptive planning in order to ensure that mechanisms used to ensure the future of water supply remain appropriate over the 25 year forecast period.
- 2.32** The 2006 Plan also highlighted the broader range of possible contributors to more effective water management, including government agencies, councils, industrial and commercial enterprise, agriculture, the participation of the private sector in water service provision and, finally, the community.<sup>31</sup>

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<sup>26</sup> Institute for Sustainable Futures at the University of Technology, Sydney, ACIL Tasman, SMEC Australia, *Review of the Metropolitan Water Plan: Final Report*, April 2006, p74 <[www.waterforlife.nsw.gov.au/government/p/isf\\_acil\\_review\\_april06\\_final\\_1.pdf](http://www.waterforlife.nsw.gov.au/government/p/isf_acil_review_april06_final_1.pdf)> (accessed 20 May 2006)

<sup>27</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p1

<sup>28</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p3

<sup>29</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p7

<sup>30</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p7

<sup>31</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p120

- 2.33** The following table from the Metropolitan Water Plan 2006 indicates the various roles of the government agencies involved in water management.<sup>32</sup>

***Table 2.1: Main NSW Government agencies involved in the implementation of the water plan***

|  |   |
|--|---|
| Sydney Catchment Authority                         | Supplies bulk water on a day-to-day basis; protects raw water quality through the management of the drinking water inner catchments and protection actions in the wider catchments                      |
| Sydney Water Corporation                           | Treats the bulk water in its filtration plants and delivers it through the distribution network; manages wastewater; and implements a wide range of programs to increase water efficiency and recycling |
| Department of Energy, Utilities and Sustainability | Administers the Water Savings Fund, Water Savings Action Plans, develops guidance on recycling  |
| Department of Planning                             | Implements BASIX to reduce water use in dwellings   |
| Department of Environment and Conservation         | Licenses wastewater treatment plants and develops policy settings to protect river health   |
| Department of Natural Resources                    | Allocates water for urban consumption, irrigation and environmental water (through water sharing plans and licensing)   |
| Department of Health                               | Protects public health through appropriate water quality standards  |
| Department of Primary Industries                   | Promotes water efficiency in the agricultural sector  |
| Independent Pricing and Regulatory Tribunal        | Determines prices for water and wastewater services   |
| The Cabinet Office, Metropolitan Water Directorate | Central coordination across agencies of water planning for the greater Sydney metropolitan region   |

## Local Government input

- 2.34** Local councils have a number of responsibilities in relation to water service provision, including water supply and sewerage services.<sup>33</sup> In particular, local government has the responsibility for the management of stormwater systems. In addition, until recently, local councils provided development approval for devices such as rainwater tanks and greywater reuse systems.<sup>34</sup>

<sup>32</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p120

<sup>33</sup> *Local Government Act 1993*, Division 2, Chapter 6, Part 52

<sup>34</sup> Mr Ryan Fletcher, Director, Policy and Research, Local Government and Shires Association of New South Wales, Evidence, 10 March 2006, p28

- 2.35** As councils in the Sydney region are major water users and managers, the Government has recently required them to produce Water Savings Action Plans, which aim to identify and implement areas in which water savings can be made.<sup>35</sup>

## Key terms

### Sustainability

- 2.36** The term sustainability focussed the terms of reference of this inquiry on the broader issue of a long-term strategic supply of water for Sydney, rather than simply the benefits or disadvantages of a desalination plant. The term refers to a holistic approach to municipal development:

*Sustainable development*, or *sustainability* for short, is easily understood at its most basic level. It means that in a global context any economic or social development should improve, not harm, the environment.<sup>36</sup>

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.<sup>37</sup>

### Triple Bottom line

- 2.37** Resource issues have traditionally been assessed by looking at the 'bottom line', that is by looking at the financial implications of specific projects. However, there is increasing evidence of the need to look at more than the economic implication of policy choices in government decision-making. This is particularly relevant in the area of water resource management.
- 2.38** At the Australian Water Summit Sydney 2006, Professor Tally Palmer from the Institute for Water and Environmental Resource Management, University of Technology, spoke of the need to identify priorities and assess environmental issues alongside social and economic benefits in relation to water resource management. This connection of the social, economic and environmental issues is becoming known as the triple bottom line. To achieve a sustainable water supply for Sydney it is important that water management strategies aim for the point where social, economic and environmental needs and benefits intersect.<sup>38</sup>
- 2.39** Analysing the non-market benefits and costs also helps to identify stakeholders and developing collaborative partnerships in project planning processes.

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<sup>35</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p56

<sup>36</sup> Newman P, Kenworthy J, *Sustainability and Cities: Overcoming Automobile Dependence*, Island Press, USA, 1999, p1

<sup>37</sup> Brundtland, World Commission on Environment and Development, 1989, p43

<sup>38</sup> Professor Tally Palmer, Institute for Water and Environmental Resource Management, University of Technology, *Presentation*, Australian Water Summit, Sydney, 14 March 2006

## Chapter 3 The proposed desalination plant at Kurnell

At the time of the establishment of this inquiry on 1 December 2005, the proposed desalination plant at Kurnell was a high-profile issue attracting intensive public comment and debate. At that time, the Government was committed to constructing the plant by 2008. In the face of strong opposition the Government publicly reaffirmed its intentions. In November 2005, the then Utilities Minister was reported as stating: ‘...the Government’s job is to make tough decisions and the new Premier is not afraid to “stop the talk and do the walk and get on and build it”’.<sup>39</sup> The proposal had been declared to be critical infrastructure and the Environmental Assessment (EA) document had been placed on public exhibition.

However, on 8 February 2006, the Premier released the February 2006 Progress Report on the Metropolitan Water Plan. In it the Premier announced that based on advice he was confident that Sydney had more than enough water to meet its normal growth needs for at least the next ten years without the need to build a desalination plant. Nevertheless, the Government decided to continue work so as to have the capacity to construct and operate a desalination plant within 26 months of dam levels falling to 30% capacity. While for many the heat has gone out of the debate regarding desalination, the environmental impact of and the environmental assessment process associated with the proposed desalination plant remain current.

### Background to the announcements on the desalination plant at Kurnell

**3.1** The Metropolitan Water Plan 2004, which was released in October 2004, first foreshadowed consideration of a desalination plant as a contingency measure in this or future droughts. Mr David Evans, the Managing Director of Sydney Water, told the Committee:

If you go back to 2004, when the Metropolitan Water Plan was put out, it foreshadowed recycling, it foreshadowed the investigation of desalination, it foreshadowed the testing for groundwater ... and it foreshadowed the demand management initiatives.<sup>40</sup>

**3.2** The Summary of the Environmental Assessment of the Concept Plan for Sydney’s Desalination Project (the EA) provides an outline of key milestones in the development of the desalination project up to the date of the document’s release in November 2005. It indicates that:

- Planning for desalination commenced in January 2005.
- In April 2005, Sydney Water confirmed that desalination was a feasible option for Sydney. In June 2005 Sydney Water called for expressions of interest from organisations capable of designing, constructing and operating a desalination plant. Kurnell was selected as the location for the desalination plant in July 2005.

<sup>39</sup> Frew, W, and Moore, M, ‘Murky Waters,’ *Sydney Morning Herald*, 26 November 2005, <[www.smh.com.au](http://www.smh.com.au)> (accessed 13 December 2005)

<sup>40</sup> Mr Evans, Evidence, 23 March 2006, p12

- In August 2005, the NSW Government confirmed that a desalination plant would be built to safeguard Sydney's water supply. A Planning Focus Meeting (PFM) was held that month. It was hosted by the then Department of Infrastructure, Planning and Natural Resources to discuss the project with statutory authorities prior to finalising the Director General's requirements for the EA. The PFM reportedly provided statutory authorities with the opportunity to be briefed on the project to help them identify key environmental assessment issues.<sup>41</sup>
- In September 2005, a final site at Kurnell was selected for construction of a desalination plant. Also in that month three consortia were short-listed to develop detailed designs and plans to build the desalination plant. The three consortia were Sydney AquaSolutions, Freshwater Alliance and Pure Solutions. Sydney AquaSolutions subsequently withdrew from the bidding in November 2005.
- On 8 November 2005, the Commonwealth Minister for Environment and Heritage advised in writing that the desalination project was not likely to have a significant impact on any matters protected under the *Environmental Planning and Assessment Act 1979* (EP&A Act) and was therefore not a controlled action under that Act.
- On the 10 November 2005, Sydney Water lodged a Major Projects application (Project application No. 05\_0082) with the Department of Planning (DoP).
- On 16 November 2005 the Minister for Planning declared the desalination plant to be critical infrastructure under section 75C of the EP&A Act. The Minister also authorised submission of a Concept Plan pursuant to section 75M(1) of the Act.
- On 18 November 2005 the Director General of DoP issued Sydney Water with requirements for EA of the desalination plant (consistent with earlier guidance given by the Department in September).
- On 23 November 2005, the Premier announced that the Government would commission a smaller desalination plant than the 500 megalitre plant mooted, one capable of producing 125 megalitres of water a day. The plant would be fully paid for through Government funding, not a public private partnership.<sup>42</sup> The rationale for choosing this model was that it would provide the flexibility to use the plant when water levels dropped, rather than running the plant at capacity, which a privately owned company may have wanted.<sup>43</sup>
- On 24 November 2005, the EA prepared by Sydney Water Corporation went on public exhibition, with the public invited to make a submission on the proposal. The period of public exhibition was later extended to 71 days until 3 February 2006.
- On 29 November 2005, the Minister for Planning directed that an independent panel be established into the Kurnell desalination project.

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<sup>41</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, p3.2

<sup>42</sup> Davies A, Frew W, Moore M, 'Water solution a drop in the ocean,' *Sydney Morning Herald*, 24 November 2005, <www.smh.com.au> (accessed 13 December 2005)

<sup>43</sup> Davies A, Frew W, Moore M, 'Water solution a drop in the ocean,' *Sydney Morning Herald*, 24 November 2005, <www.smh.com.au> (accessed 13 December 2005)

- On 8 February 2006 the Premier announced that construction of the desalination plant had been deferred indefinitely. Construction is now dependent upon Sydney's water supply falling to 30% of dam capacity, as discussed below.

### The likelihood of the need to construct a desalination plant

**3.3** The Government's trigger for the construction of the desalination plant is a dramatic drop in Sydney's dam storage levels. If dam levels drop to approximately 40% capacity, the aquifers at Kangaloon in the Southern Highlands and Leonay in Western Sydney are to be accessed as a first line of defence against a failure of supply. If storage levels drop to 30%, construction will commence on a 125-megalitre desalination plant at Kurnell.<sup>44</sup>

**3.4** At the public hearing on 23 March 2006, Mr Evans told the Committee that a desalination plant is now not considered part of the Sydney Water supply matrix. However, he also noted that it was important to have the capacity to bring a desalination plant within the matrix in a timeframe that does not challenge water availability. In evidence to the Committee, Mr Evans said:

Desalination has been identified as the ultimate fallback in the event of preservation of very severe drought conditions. It is clearly an area where use of it is growing around the world; it is growing very fast because there has been a lot of technological change and a lot of demand for diversification of supply. Perth is proceeding with a plant; the Gold Coast is actively considering one. Our position is not to construct one as a mainstream part of the water supply but to have it available as a fallback in the event we got reactivation of the very severe drought conditions ... and they were to be sustained.

The issue with major infrastructure projects of this type is that they typically take about four years to go from idea to construction and if you have severe and accelerated drought, the difficulty is that if you let the four years elapse you would be really challenging your available storages in severe drought. So what we are trying to do is get the best of both worlds by doing enough work to be prepared to build a plant, not with a four-year lead time but with only a two-year lead time and thus be able to postpone the need to do it until storages, after allowance for the deep storages ... were down around 30 per cent. That means there is not a high probability of having to build a plant, but it means if we do the preparatory work we could do it quickly enough to bring supplies online in the event of severe drought being sustained and therefore put the community in a position to know that they will not run out of water.<sup>45</sup>

**3.5** Mr Evans was subsequently asked his view on various proposals to use treated sewage water and pump it back to Sydney's storage systems as a means of augmenting the potable supply of water. In response, Mr Evans commented that such schemes were very costly and put the likelihood of dam storage levels falling to 30% in the following perspective:

<sup>44</sup> Hon M Iemma MP, Premier, 'Securing Sydney's long term water supply,' *Media Release*, 8 February 2006

<sup>45</sup> Mr Evans, Evidence, 23 March 2006, pp6 – 7

... we have had nine years of drought and yet, after allowing for the deep storages to come on line, storage facilities are half full. We have the capability to cope with the growth through what we think are cost-effective means. There is no philosophical problem with using effluent from the ocean outfalls; it is purely a question of social cost effectiveness, and the costs are substantial.<sup>46</sup>

- 3.6** It was put to Mr Evans that the cost of a desalination plant is also substantial. In response, Mr Evans argued that if the circumstances required to trigger construction of a desalination plant eventuated, then the cost would need to be borne as a necessity:

... the desalination plant is expensive but it is there for a circumstance where the water would be very valuable because we would be in severe and extreme drought and we would have 4 million people looking for where their next drink was coming from. It is not proposed as a base load facility, if you like. It is there for a situation where the scarcity would be much elevated.<sup>47</sup>

- 3.7** The Committee also notes evidence that the desalination plan, even as a fallback option, should never be required if advantage is taken of the available water supply options. For example, Dr Stuart Khan, Research Fellow at the Centre for Water and Waste Technology at the University of New South Wales said:

With regard to the desalination plant, there may be a place for desalination in the future if we really find that Sydney has become a desert and there are no other options for finding water in Sydney.<sup>48</sup>

- 3.8** Dr Khan went on to compare the volume of water available from sewage treatment plants to that which could be provided by a desalination plant:

In the inland sewage treatment plants around Sydney there is in excess of 200 megalitres per day, compared with 125 megalitres per day from the desalination plant, if we wanted to start taking water directly from Malabar, Bondi and North Head, I think about 450 per day is available from Malabar, about 130 per day from Bondi and 330 from North Head – that is dry weather flow. So, much more, 10 times more than we are talking about with regard to the desalination plant.<sup>49</sup>

- 3.9** The above figures are roughly comparable with those provided in Sydney Water's Answers to Questions on Notice, which reported that a combined total of 445,348 megalitres of sewage was discharged from sewage treatment plants in 2004/2005. This equates to 1,250 megalitres per day.<sup>50</sup>

- 3.10** Mr Ian Kiernan, Executive Chairman of Clean Up Australia Ltd was the deputy chair of a government-appointed panel of experts established to consider options for Sydney's water

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<sup>46</sup> Mr Evans, Evidence, 23 March 2006, p13 (see also p19)

<sup>47</sup> Mr Evans, Evidence, 23 March 2006, p19

<sup>48</sup> Dr Khan, Evidence, 20 March 2006, p15

<sup>49</sup> Dr Khan, Evidence, 20 March 2006, p15

<sup>50</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr David Evans, General Manger, Sydney Water, Question 10

supply. The panel produced a report in July 2004 entitled *A Sustainable Water Supply for Sydney*. The report was never publicly released.

- 3.11** Mr Kiernan told the Committee that the recommendations of the report, if implemented, would have ensured a sustainable water supply Sydney for the next twenty years. The report considered four options for water management in Sydney: industrial reuse and recycling, stormwater management, sewer mining and desalination:

The fourth place we needed to look at was desalination, because we could not ignore the option, but it was the least favoured and least acceptable option.

...

It is only once those strategies [industrial use/recycling; stormwater management and sewer mining] have been fully explored and in the eventuality of a calamitous drought period, desalination should be considered.<sup>51</sup>

- 3.12** Indeed, Professor Nicholas Ashbolt, Head of School of Civil and Environmental Engineering at the University of New South Wales, put forward the view that having a desalination strategy as a fallback position in case of worsening water supply could have the effect of stifling more innovative long-term planning:

We have also had commissioned reports, like this one, which followed in February 2006, from a couple of consultants, saying that we now do not need to worry so much, we have some groundwater that might feed into the system and therefore everything is okay and the desalination plant can be brought online if a drought should suddenly necessitate that. To me, this is a little head in the sand in the way of thinking; we need to be planning for the long-term future. We should not be waiting for the next drought or crisis to suddenly put on desalination, which I think many of us would consider, whilst a solution that is technically achievable, is not really the most sustainable solution, in the sense of energy, the environment and the provision of water services.<sup>52</sup>

- 3.13** By contrast, Mr Ross Young, Executive Director of the Water Services Association of Australia argued that no particular strategy should be ruled out and that desalination should be assessed on its merits like all other options:

We believe it is a “horses for courses” approach and that any policy that says “Thou shalt never build a desalination plant” is probably not prudent in this age of climatic uncertainty that we are living in. We must bear in mind that our historical rainfall and run-off records only go back 100 years or so. Who is to know we are not going to experience a drought that we have never had? And we cannot afford our cities to run out of water.<sup>53</sup>

<sup>51</sup> Mr Kiernan, Evidence, 10 March 2006, p2. See also ‘Desalting water was option of last resort,’ *The Australian*, 17 January 2006

<sup>52</sup> Professor Ashbolt, Evidence, 20 March 2006, p29

<sup>53</sup> Mr Young, Evidence, 20 March 2006, p49

**3.14** Indeed, Professor Roya Sheikholeslami, President of the Australian Desalination Association expressed the view that Sydney will inevitably need a desalination plant.<sup>54</sup> However, to put her view in context:

It [a desalination plant] is not to replace water re-use, conservation of water, better infrastructure or better catchments. It is the source of water when all those things have been done and still you do not have water.<sup>55</sup>

**3.15** Finally, the Committee again notes the comments of Mr Evans on this issue. Mr Evans argued that the capacity to implement desalination as a contingency response in the event of an extreme drought provides the surety to progress with alternative solutions:

The rationale for having all this capacity is not necessarily to rush out and do them all instantly but to have a coherent set of responses that you can apply over time and, given those backup responses, create the space or the opportunity to press here your primary instruments which are demand management, recycling, conventional storage solutions, et cetera. But I think it is important to have the backups available. That, in effect, creates the opportunity for us to do our climate change studies, pursue the demand management initiatives and implement BASIX and the like whilst avoiding the pressure of this instant fear: What if it all does not work? Are we going to run out of water? You have to be able to go to the community and say, "We have a coherent set of contingency approaches."<sup>56</sup>

## **The Kurnell pilot plant**

**3.16** Even though construction of a major desalination plant at Kurnell has been deferred, activity is still continuing at the Kurnell site. A pilot plant is being constructed.

**3.17** The Committee made a written request to Sydney Water to provide an update on what is occurring at the Kurnell site and any timeframes for further activity. Sydney Water advised:

Sediment and erosion control is currently in progress on the Kurnell site. This includes additional detention ponds, re-grading of surface contours, silt fencing to prevent soil running off site or into conservation area.

The following additional activities on the site will occur between April and June 2006:

- Construction of an access road;
- Security fencing;
- Completing the installation of the Pilot Plant – the Plant will then be operating for approximately one year;
- Control of weeds at the main site. An initial weed removal program for the conservation area will commence mid-year and take until the end of 2006; and

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<sup>54</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p59

<sup>55</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p60

<sup>56</sup> Mr Evans, Evidence, 23 March 2006, p3

- Removal of a small amount of diesel contaminated soil.<sup>57</sup>

**3.18** Mr Evans advised in evidence that the blueprint design for the pilot plant is expected to cost approximately \$120 million. Mr Evans further advised that the vast majority of this amount has been provided for by way of the existing Independent Pricing and Regulatory Tribunal price part agreement.<sup>58</sup>

**3.19** Mr Evans also explained the purpose of the pilot plant was to test the quality of the seawater to inform the design of pre-treatment stages and of membranes to remove salt from seawater. Mr Evans said:

So the pilot plant is like a laboratory. It is not a mini treatment plant, in the sense of producing the end product out the other end, with filters and all that sort of thing. It is like an on-site laboratory, to enable you to do, under match conditions as it were, the testing so that you can match the actual ocean conditions and the circumstances that you require in completing a design, and that will happen over the next six to eight months.<sup>59</sup>

**3.20** The Committee notes, however, that during the public hearing on 10 March 2006, Councillor Kelly Knowles of Sutherland Shire Council told the Committee that her Council and local community groups were not well informed on what was occurring with respect to the pilot plant:

From community members who have formed part of council's working party, who have set foot on that site and have monitored this issue, we are aware that there is a plant in operation – whether it is considered to be the pilot plant is another question and I will get to that in a moment. There is an intake pipe that is at the exact spot and already drilling that has occurred underneath the national park has what appears to be some structures up and running using the STP [sewerage treatment plant] for the outfall. We understand from that that there is testing being done around what a desalination plant would do in that peninsula and some of the environmental effects.

Insofar as there being a pilot plant up and running, Sutherland Council is in the dark about what that pilot plant will be. We know as much as the media knows and we have, unfortunately, been in the position where Sydney Water has been very reluctant to tell us the goings-on of that site. In fact, we would invite this inquiry to ask Sydney Water what the future of that pilot plant will be and whether that testing would become available to not only this Parliament but also to Sutherland Council and the various community groups who have an interest in this, not to mention our local environment centre who equally would be interested in knowing some of the detail around a pilot plant. The short of it is: we are in the dark.<sup>60</sup>

**3.21** The Committee understands that Sutherland Shire Council sent an invitation to both Sydney Water and the Department of Planning (DoP) to make a presentation to the Council to provide detailed information on what was occurring at the plant.<sup>61</sup>

<sup>57</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 1, p1

<sup>58</sup> Mr Evans, Evidence, 23 March 2006, p7

<sup>59</sup> Mr Evans, Evidence, 23 March 2006, p11

<sup>60</sup> Clr Knowles, Evidence, 10 March 2006, p55

<sup>61</sup> Clr Knowles, Evidence, 10 March 2006, p56

## The Environmental Assessment process

### The initial planning process

**3.22** As indicated, planning for the proposed desalination plant at Kurnell commenced in January 2005. The Summary of the EA document lists the following milestones in the planning process:

- January 2005 – planning for desalination commenced
- April 2005 – Sydney Water confirmed that desalination is a feasible option for Sydney
- July 2005 – Kurnell was selected as the location for a desalination plant
- August 2005 – the NSW Government confirmed that a desalination plant would be built to safeguard Sydney’s water supply
- September 2005 – a final site at Kurnell was selected for construction of a desalination plant
- [16] November 2005 – in light of the continuing drought, the NSW Minister for Planning declared the desalination plant to be critical infrastructure under section 17C of the EP&A Act. The Minister also authorised submission of a Concept Plan pursuant to section 75M(1) of the EP&A Act
- [18] November 2005 – the Director General of DoP issued Sydney Water with requirements for environmental assessment of the desalination plant (consistent with September guidance on key issues from the Department).<sup>62</sup>

**3.23** Chapter 3 of the EA provides more detail on the preliminary planning undertaken prior to the declaration of critical infrastructure and the provision of the Director General’s requirements:

A Planning Focus Meeting (PFM) was convened by the then Department of Infrastructure, Planning and Natural Resources (DIPNR) now Department of Planning (DoP) in August 2005 to discuss the project with representatives from statutory authorities prior to finalising the Director General’s requirements for the environmental assessment. The following organisations attended the meeting:

- Department of Planning (Convenor);
- Sydney Water Corporation (Proponent);
- Department of Environment and Conservation (DEC);
- Department of Primary Industries (DPI);
- Department of Energy, Utilities and Sustainability;
- Energy Australia;

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<sup>62</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney’s Desalination Project*, November 2005, pii

- TransGrid;
- Sutherland Shire Council; and
- Department of Environment and Heritage (DEH) (Commonwealth).

The PFM provided statutory authorities with the opportunity to be briefed on the project to help them identify key environmental assessment issues.

Sydney Water identified and discussed key technological and environmental issues associated with each of the main components of the proposal. Participants were invited to identify any additional key issues that would need to be addressed in the Environmental Assessment. Following consideration of these issues the Director-General issued requirements for Environmental Assessment. The preparation of the Environmental Assessment has been guided by the outcomes of the PFM and comments from the Department of Planning on key issues consistent with the issued Director General's requirements.<sup>63</sup>

- 3.24** As indicated previously, on the 10 November 2005, Sydney Water lodged a Major Projects application (Project application No. 05\_0082) with the DoP.
- 3.25** In turn, as noted above, on 18 November 2005, DoP wrote to Sydney Water regarding the application and provided the Director General's assessment requirements for the preparation of an Environmental Assessment in relation to the Concept Plan for the project. In that letter DoP advised Sydney Water that once the EA was lodged with the Department, it would consult with the relevant authorities to determine the adequacy of the EA. Following this review period, the EA was publicly exhibited from 24 November 2005 to 3 February 2006.

### **The declaration of a 'critical infrastructure project'**

- 3.26** As indicated previously, on 16 November 2005, the Minister for Planning declared the desalination plant a 'critical infrastructure project' under section 75C of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposed desalination plant at Kurnell was the first project to be declared critical infrastructure under the Act.
- 3.27** The significance of the declaration of a 'critical infrastructure project' is that critical infrastructure projects do not require the conduct of an Environmental Impact Statement (EIS), but rather require an Environmental Assessment. To many critics of the desalination proposal, the non-specific requirements of an Environmental Assessment, as opposed to an EIS, is their major source of concern.
- 3.28** The Department of Planning's website provides a link to a fact sheet, prepared by the former Department of Infrastructure, Planning and Natural Resources, that explained the process for approval of critical infrastructure projects:

Before a critical infrastructure project can proceed, an application must be lodged for an approval under Part 3A of the *Environmental Planning and Assessment Act*. The

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<sup>63</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, p3.2

emphasis of the assessment will be on how the project can be delivered in an environmentally sound manner. It may include the consideration of alternative solutions to achieve the required outcome. The assessment process will ensure that a focussed, integrated assessment and consultation regime is undertaken prior to recommendations being made to the Minister for determination.

In most circumstances, a concept approval will be obtained to establish the environmental performance requirements for the implementation of the subsequent stages of the project(s) and consultation requirements. The project will be carried out in accordance with that approval. As with other approvals under Part 3A, the need for additional approvals under eight other Acts has been replaced by a single integrated assessment and approval. Where a licence however is required under the *Protection of the Environment Operations Act*, such a licence will still be required.

The decision will not be appellable except if the appeal is initiated or approved by the Minister.

These provisions provide for a streamlined assessment and approval process without compromising environmental outcomes.

These reforms will:

- ensure timely and efficient delivery of critical infrastructure projects when required
- provide certainty in the delivery of key infrastructure projects
- provide for adequate environmental scrutiny with provisions to ensure environmental outcomes are appropriate
- focus on outcomes rather than process.<sup>64</sup>

**3.29** In turn, the EA document for the desalination plant prepared by Sydney Water provides the following overview of the Environmental Assessment process:

The new Part 3A of the EP&A Act consolidates the assessment and approval regime for all major projects previously addressed under Part 4 (Development Assessment) and Part 5 (Environmental Assessment). In general, where an Environmental Impact Statement (EIS) would have been prepared for all major projects under Part 4 of Part 5, an EA would now be prepared under Part 3A.

This EA has been prepared in accordance with the draft guidelines for assessment of major projects under Part 3A of the EP&A Act and the Director General's requirements issued for the project. It aims to:

- Describe the overall concept of the project and its likely components;
- Identify options for the delivery of the project, including examination of the alternative routes/sites, layouts and configurations;

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<sup>64</sup> Department of Infrastructure, Planning and Natural Resources, *NSW Planning reforms, Part 3A of the EP&A Act, Fact sheet 4, August 2005, Critical Infrastructure projects*, <[www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)>

- Assess environmental issues in accordance with the guidelines for Part 3A proposals and the Director General's requirements for the EA;
- Assess impacts with specific focus on identified key issues; and
- Present a statement of commitments that defines the management, mitigation and monitoring regime to be implemented to avoid, reduce and manage key environmental issues.

The EA has been prepared to assess the range of options that are under consideration for the desalination project. To this end, the project scope includes several potential construction methodologies and routes to deliver water to the major distribution network. This approach has been developed to enable the winning consortium to pursue potentially innovative solutions and the general public (through public comment on the EA) to have input to the various options.

The key differences between an EIS and an EA document are:

- An EA document can be based on a project concept (as is the case for the desalination proposal) and may consider alternatives or staging. An EIS would generally be prepared upon availability of a more detailed design;
- Although both an EA and EIS must be prepared in accordance with requirements specified by the Director General of the Department of Planning, an EA document focuses on assessment of key environmental issues identified using a risk-based approach. An EIS does not differentiate key environmental issues and considers all issues in detail; and
- An EA document incorporates management, mitigation and monitoring measures in a Statement of Commitments prepared by the proponent. This statement is designed to be incorporated into the approvals conditions. An EIS usually includes mitigation measures but these are generally not described in a way that allows them to be incorporated directly into approval or consent conditions.”<sup>65</sup>

### The Independent Panel

- 3.30** As indicated, on 29 November 2006, the Minister for Planning directed that an independent panel be established into the Kurnell desalination project. The Minister appointed Emeritus Professor Rolf Prince AO (Chair), Mr Tony Wright and Dr Gary Cox to constitute the panel.
- 3.31** The panel is constituted under s.75G (Independent Hearing and Assessment Panels) of the EP&A Act, which allows for the constitution of a panel of experts or a panel of officers representing the Department and other relevant public authorities to assess any aspect of a project referred to the panel by the Minister. This is not a requirement under the Act but rather a discretionary power of the Minister.
- 3.32** The Minister specified the following terms of reference for the panel:

<sup>65</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, pp3.6-3.7

- To ensure that all issues raised by the community and stakeholders in submissions to the publicly exhibited Environmental Assessment report prepared by Sydney Water are adequately addressed and responded to by Sydney Water.
- To monitor other forms of community input (other than direct written submissions), issue compilation and assessment, so as to ensure all relevant matters are adequately addressed by the Department in its advice to the Minister.
- To ensure that issues raised in community and stakeholder submissions and Sydney Water responses thereto are adequately addressed and included in the Department of Planning's assessment of the proposal and in the Department's advice to the Minister.

**3.33** The Committee notes that 91% of the 760 submissions received during the public exhibition of the EA were opposed to the desalination project.<sup>66</sup>

**3.34** The Committee was advised that the appointment of the Independent Panel would ensure there was 'independent scrutiny of all submissions' and that copies of all submissions received during the public exhibition of the EA were sent to the panel for its consideration.<sup>67</sup>

### **The Preferred Project Report**

**3.35** Section 75H (Environmental assessment and public consultation) of the EP&A Act allows, among other things, for the preparation of a preferred project report (PPR) by a development proponent. The relevant clauses read:

(6) The Director General may require the proponent to submit to the Director General

(a) a response to the issues raised in those submissions [on the publicly exhibited Environmental Assessment] and

(b) a preferred project report that outlines any proposed changes to the project to minimise its environmental impact and

(c) any revised statement of commitments.

(7) If the Director General considers that significant changes are proposed to the nature of the project, the Director General may require the proponent to make the preferred project report available to the public.

**3.36** During the public hearing on 23 March 2006, Mr Sam Haddad, Director General of DoP, indicated that Sydney Water is currently preparing the PPR, which will be made available to the public once the Department receives it. It is expected that this report from Sydney Water will address all issues raised in the submissions.<sup>68</sup> Mr Haddad further commented:

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<sup>66</sup> Mr Haddad, Evidence, 23 March 2006, p27

<sup>67</sup> Mr Haddad, Evidence, 23 March 2006, p27

<sup>68</sup> Mr Haddad, Evidence, 23 March 2006, p27

We are also obliged to make available publicly the proponent's response to the issues raised in the submissions.

When people have raised all those submissions and highlighted what they are, the response of Sydney Water will have to be made publicly available and what they have done about it or not. That is a practice that we did not have before in all cases.<sup>69</sup>

- 3.37** Mr Haddad also advised the Committee that the Independent Panel will provide advice on the adequacy of the Preferred Project Report. Sydney Water provided a description of the input they were receiving from the Independent Panel:

Sydney Water, in conjunction with the Department of Planning, developed and implemented a process for identifying and cataloguing all issues raised in submissions on the Environmental Assessment Report for the desalination proposal. These issues will be systematically addressed in the Preferred Project Report (PPR).

The Independent Panel is auditing this process, from receipt of submission to the manner in which the issues raised will be addressed in the PPR. This has involved members of the Independent Panel sighting the submissions, assessing that relevant issues will be comprehensively identified and responded to via the review of the PPR.<sup>70</sup>

- 3.38** DoP was unable to provide the Committee with a timeframe for when it anticipated it would publish the PPR or the report from the Independent Panel.

### **The role of the Department of Environment and Conservation**

- 3.39** At the public hearing on 23 March 2006, Ms Lisa Corbyn, the Director General of the Department of Environment and Conservation (DEC), gave an overview of the Department's role in the preparation of the desalination plant EA.
- 3.40** Ms Corbyn advised that the DEC had provided input to the assessment of the environmental impacts of the desalination plant and that the DEC would continue to work with DoP on any matters associated with the completion of the assessment. Ms Corbyn went on to say:

Given our licensing role, a key issue for us in the assessment has been water quality. For example, we have been concerned to make sure that the best approach is provided to reduce impacts from any discharge from a plant. We have asked that the proponent address detailed comments on water quality, and although we are not responsible for regulating greenhouse gases, we have also recommended that Sydney Water develop credible and secure offsets for energy usage of the plant ... And we have advised on the importance of considering any construction impacts on threatened species and Aboriginal cultural heritage and protection of all the nature reserves, national park and aquatic reserves in the vicinity of the proposal.<sup>71</sup>

<sup>69</sup> Mr Haddad, Evidence, 23 March 2006, p35

<sup>70</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 2, p2

<sup>71</sup> Ms Corbyn, Evidence, 23 March 2006, pp25-26

- 3.41** Ms Corbyn was subsequently asked whether the EA complied with the DEC's guidelines for threatened species assessment and also whether the level of assessment for threatened species on the plant site was sufficient to make an informed assessment, given the EA did not include detailed surveys for threatened species beyond the proposed plant site. In response, Ms Corbyn said:

We have asked to make sure that there is sufficient information. Generally we have quite good information on the site from a range of different work that has been done, but certainly we raised with Sydney Water the need to make sure that the configurations that might come forward ensured that we avoided biodiversity loss. They have some capacity to do that.<sup>72</sup>

- 3.42** Ms Corbyn added that the DEC has kept the issues of the plant discharge and intake area on the agenda for further assessment:

There has been quite a bit of work done not only for the pilot plants but also for the full-scale plants so that people have a much better understanding of not only what is there but what might be affected as well. We have kept it on the agenda to make sure that we have sufficient information to be able to assess that.<sup>73</sup>

- 3.43** Under section 75H of the EP&A Act, DoP was required to send to the DEC copies of the submissions, or a report of the issues raised in those submissions, made during the public exhibition of the EA. The Committee requested advice from the DEC whether this occurred and whether the issues raised in those submissions were of concern to the DEC. The DEC responded:

The DEC did receive copies of the submissions. The issues raised in these submissions that were of concern to DEC were ones that the DEC had already raised in discussions with the Department of Planning and the proponent; and were also included in the DEC submission which was submitted at the end of the public consultation period.<sup>74</sup>

- 3.44** While the DEC did not choose to provide specific detail, it appears from the comments from the Director General of the DEC that it has kept some issues on the agenda with Sydney Water until sufficient information is available.

### **Concerns about the quality of the Environmental Assessment**

- 3.45** The committee notes that a number of parties expressed strong concerns about the quality and content of the EA of the proposed desalination plant.

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<sup>72</sup> Ms Corbyn, Evidence, 23 March 2006, p37

<sup>73</sup> Ms Corbyn, Evidence, 23 March 2006, p37

<sup>74</sup> Answers to questions on notice taken during evidence 23 March 2006, Ms Lisa Corbyn, Director General, Department of Environment and Conservation, Question 1, p1

**3.46** Sutherland Shire Council provided a comprehensive submission to the inquiry.<sup>75</sup> As part of that submission, the Council included its January 2006 submission and February 2006 supplementary submission to DoP in response to the public exhibition of the EA.

**3.47** Both of the Sutherland Shire submissions to DoP provide a lengthy critique of the EA. In general, the primary criticism of the EA was its lack of specific detail, thereby preventing an adequate assessment:

The Environmental Assessment (EA) for the proposed desalination plant states that the Concept Plan is sufficient to “*assess the key environmental aspects of the project and determine the required level of environmental management and monitoring for the project*”. However, the EA is completely lacking in critical detail such as distribution routes, methods of construction or the environmental impacts of the project.

The process provided no opportunity for Council to review the adequacy of the Environmental Assessment prior to it being placed on public exhibition. The process also provides no opportunity for the community or Council to be consulted with once further information critical to the adequate review of the proposal, such as distribution routes and impacts on marine ecosystems, becomes available. This is considered unacceptable and is not in the spirit of the recent revisions to the *Environmental Planning and Assessment Act 1979*.<sup>76</sup>

**3.48** At the public hearing on 10 March, in her opening statement to the Committee, Councillor Kelly Knowles summarised Sutherland Shire Council’s concerns regarding the EA, the consultation process and the continuing activity at the Kurnell site:

On Kurnell it appears as if the proposal put by the State Government has been assessed in what I call a vacuum; that is, assessment has only been based on the site itself but not the surrounding area that will be equally affected by this proposal.

...

We have been dissatisfied with the amount of critical inspection through an environmental assessment and therefore, through that, a lack of guarantees in terms of protecting the environment as a result of this desalination plant. This has created some difficulties for us in terms not only the process and providing submissions to not only this parliamentary inquiry but as part of the approval process of a desalination plant proposal. In fact I think as well as that we have had insignificant amounts of consultation in the immediate area with the residents of Kurnell but also in the broader community. We saw what I think is a manufactured consultation process where we were forced to see a Pepsi-style taste testing as a form of consultation – asking people to taste desalinated water, when the issues have never been about desalination in terms of what the water tastes like, but about the environmental impacts and cost benefits.

As well as that we saw three meetings at Marrickville, Rockdale and at Sutherland, or actually broadly we would call at Cronulla, that were controlled, at the least. That is probably the most conservative statement to make about the nature of that consultative process. As well as that, if we look at the environmental assessment and

<sup>75</sup> Submission 129, Sutherland Shire Council

<sup>76</sup> Submission 129, Sutherland Shire Council, p5

the lack of detail, not only was Sutherland Council as the local area council given no opportunity to review the assessment process before it went to public consultation – indeed we have a lot of information about the Kurnell Peninsula and the environmental heritage that we have on that peninsula – but also the lack of consultation in the future continues, even though the State Government has shelved the desalination plant proposal. Continuing on that peninsula is \$120 million, which is money to purchase two sites to continue a pilot plant and to provide compensation to two consortiums as a result of the announcement of the shelving. So we still have a pilot plant out there.

Unfortunately, though, no matter what assessment and testing occurs for that pilot plant, Sutherland Council at this point in time has no access to any of the results of that testing. There are quite a number of outstanding issues, including delivery routes, including the nature of the impact upon the marine environment, the nature of the toxic and highly intensive salt plumes that will come out of any potential plant on that peninsula and impact upon marine ecology, such as the sea grasses there and the reef area as well as whale migration. We will not have access to that information. To me, that is not in the spirit of the environmental legislation that New South Wales abides by and we have an ongoing concern about the nature of calling such a proposal, being a desalination plant, critical infrastructure going forward, given the shelving of the plant.<sup>77</sup>

**3.49** The submission from Sutherland Shire Council provided a brief summary of the concerns and issues that it raised in its two submissions to DoP:

Greenhouse gas emissions – while the plant will be a significant contributor to greenhouse gas emissions, there is little detail and no certainty to the proposed mitigating measures.

Terrestrial Ecology – the Kurnell peninsular and many of the proposed distribution routes contain threatened species and endangered ecological communities, but there is no certainty to the potential routes, and there has been no assessment of delivery infrastructure on Kurnell Peninsula or elsewhere.

Indigenous Heritage – the Kurnell peninsular has a rich heritage of aboriginal occupation, despite this there has been no assessment of impact of delivery infrastructure on Kurnell Peninsula or elsewhere.

Water Quality – assessment of the impacts of the proposal on water quality are not possible as there is no detailed assessment of impacts within the mixing zone, lack of calibration of dispersal modelling, and lack of understanding of dense plume dispersal. There has also been no accurate assessment of water quality impacts as Sydney Water doesn't know the type or volume of chemicals used or existing water quality.

Aquatic Ecology – one of the major potential impacts of the proposed plant is the impact on marine ecosystems, both from the water intake and the outlet discharge. Despite this there is no accurate assessment of the impact on marine ecosystems as there is no knowledge of the impact of increased salinity or discharge chemicals on receiving species, and there is no knowledge of the planktonic community in the region of the intake or outlet.

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<sup>77</sup> Clr Knowles, Evidence, 10 March 2006, pp49-50

Aquatic Ecology Botany Bay – the laying of distribution pipe work across Botany Bay will impact on seagrasses and benthic communities. Work in assessing these impacts has been inadequate as there are potential routes that have significantly lower impacts on sea grasses than those proposed by Sydney Water. Sydney Water also notes they will restore sea grasses, but *Posidonia* restoration has met with very limited success.

Spoil Management – accurate assessment of the impact of spoil disposal is not possible as there is no definite proposal and the EA itself acknowledges that impacts beyond the Kurnell Peninsula have not been accurately assessed, rather a range of management actions are presented which potentially cause other problems, i.e. avoidance of AM and PM peaks leads to poor intersection performance at other times.<sup>78</sup>

- 3.50** Sutherland Shire Council’s concerns regarding the lack of detail provided in the EA were shared by Marrickville Council. Councillor Sam Byrne, Mayor of Marrickville Council and Executive Member of the Local Government and Shires Association of New South Wales, told the Committee that Marrickville took a clear position of opposition to the desalination plant, because the lack of specific detail about the infrastructure for the proposed plant made it difficult to provide comment on the proposal:

Marrickville’s specific issues were, because the pipes were planned to come through our area, that we had no real details on the routes, no real details on how the pipes were going to be made or timing. We just had very little information. In the process this was the only consultation, or this was the only time, we were going to be able to provide input on the routes and we did not even know what the routes were. From our area people were saying, “What is this? We do not even know what this is. We cannot comment on it.”<sup>79</sup>

- 3.51** Similarly, Mr Robert Walshe, Convenor of the Combined Community Groups of Sutherland Shire Concerned with Water Saving in Greater Sydney advised that his organisation also had not received any information on the proposed route of the pipeline across the bay:

No, absolutely nothing definite at all. There is even talk of will they be laying a pipe across the bay or will they be tunnelling under the bay. Things are as open and undecided as that. This is what an EIS would specifically cover and can conclude.<sup>80</sup>

- 3.52** In turn, Mr Klass Boes, a representative of the Kurnell Progress and Precinct Association Incorporated, told the Committee that this lack of information has given the local community no option but to oppose the proposed development:

So we in the Kurnell community have quite a few questions that we would like answers on. We do not have those answers. Those things of themselves provide enough reason for us to object to a desalination plant being put on the Kurnell peninsula. Unless we get some clear answers on how it is proposed to do this, we feel we should strongly object to what is proposed.<sup>81</sup>

<sup>78</sup> Submission 129, Sutherland Shire Council, pp3-4

<sup>79</sup> Mr Byrne, Evidence, 10 March 2006, p23

<sup>80</sup> Mr Walshe, Evidence, 23 March 2006, p45

<sup>81</sup> Mr Boes, Evidence, 23 March 2006, p46

**3.53** As noted above, the Sutherland Shire Council in particular also expressed dissatisfaction at the level of consultation and input it had into the EA process. The only time it was mentioned as being consulted was at the August PFM meeting.

**3.54** In response, Mr Haddad argued that the consultation and public exhibition period for the EA went beyond statutory requirements:

The environmental assessment documentation was publicly exhibited. It was made widely available during the exhibition period. My advice is that the exhibition period lasted more than 70 days – and that is in excess of the 30-day statutory requirements. The project was exhibited at seven separate locations. It was made available for inspection and downloading on the department’s web sites. A dedicated e-mail address was also created and the proposal was twice advertised, I understand, on some 11 local and metropolitan media outlets. More than 1,200 property owners and occupiers were also directly notified by me and invited to make submissions by the departments. I am advised also that Sydney Water undertook a separate community consultation program, both before and during the preparation of the environmental assessments and during the exhibit period, with a variety of groups and agencies.<sup>82</sup>

### **Should the desalination plant still be assessed as critical infrastructure?**

**3.55** The Committee notes that the desalination plant continues to be assessed as a critical piece of infrastructure under Part 3A of the EP&A Act.

**3.56** However, a question that was canvassed repeatedly throughout the inquiry was whether the desalination project should continue to be deemed critical infrastructure given the Premier’s announcement in February 2006 that construction of the plant is deferred until such time as dam levels drop to 30 per cent. Invariably, when inquiry participants argued for the removal of the critical infrastructure classification, they were arguing for the conduct of a full EIS for the project.

**3.57** For example, Councillor Kenneth McDonell, Executive Member of the Local Government and Shires Association of New South Wales, stated in evidence:

At the outset, the Association is opposed to the critical infrastructure approach that removes the ability of local government to be involved in these types infrastructure developments. However, given the current situation with the desalination proposal, how critical is it now? I would hope that the Government would take the opportunity to employ a more vigorous environmental approach to the project, given that there is now time to do that; and the Government is talking about dam levels falling below 30 per cent.<sup>83</sup>

**3.58** Similarly, during the public hearing on 10 March 2006, Councillor Knowles was asked whether an EIS should be undertaken given the deferral of the immediate construction timeframe. She replied:

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<sup>82</sup> Mr Haddad, Evidence, 23 March 2006, p27

<sup>83</sup> Clr McDonell, Evidence, 10 March 2006, p26

The short answer is yes. We would love to see an environmental impact study done because that would give a solid guarantee about not only that peninsula but also about dealing with greenhouse gas emissions. At the same time our view is that following the announcement of and finding of aquifers, that this is no longer the primary method by which to solve what is in theory Sydney's water crisis. Therefore, it is no longer critical and does not fall under that component of the Environmental Planning and Assessment Act. We would want to see it fall back into the normal regime of planning proposals. We would like a full impact study to be done.<sup>84</sup>

- 3.59** Councillor Knowles further stated that she did not oppose the critical infrastructure provisions under the Act on a theoretical basis. However, she inferred that, particularly given the changing circumstances, the desalination project was an unfortunate choice for the very first use of these provisions:

Theoretically, the nature of introducing part 3A has merit in terms of ensuring that key pieces of infrastructure in New South Wales get up and running, particularly from an economic point of view, from service to the average resident or average constituent. However, when the Minister discussed part 3A on the floor of this very Parliament, he talked about some of the principles and those principles included the importance to industry and the importance to residents of New South Wales, but it was also balanced against environmental principles and balanced against key community interests and I think that balance has been lost in how critical infrastructure has been dealt with for the desalination plant and used as the prototype.<sup>85</sup>

- 3.60** Mr Walshe also argued that the change in circumstances regarding Sydney's water supply has provided an opportunity to undertake a full EIS:

We want to argue very strongly that there is now plenty of time for an EIS. We ask the Committee to see that the Premier's announcement on 8 February shelving the plant in fact has created an entirely new state of affairs. Up to February the rationale was urgency; the timeframe was 2008; so there was no time for an EIS ... The Premier's announcement makes clear that imminent acute danger is not upon us. Professor White in his report to Cabinet has said that we have until 2015 before even the worst conceivable scenario might need attention.

That is the entirely new stage we are in. So we have time to do what this Committee is aiming to do: to look carefully at all available options, but of course to do so with tremendous scientific resources and so on. We submit that the important first option is this: require Sydney Water to expertly construct an EIS. It might take up to two years but we have time to do the job thoroughly and we similarly have time to then get maximum critiquing of the EIS and we believe something very good will come out of that process. Certainly all impacts on the environment would then be fully examined.<sup>86</sup>

- 3.61** Mr Walshe went on to draw a comparison with the Cronulla Sewage Treatment Plant which he considered a successful construction that has drawn admiration from many places. Mr

<sup>84</sup> Clr Knowles, Evidence, 10 March 2006, p54

<sup>85</sup> Clr Knowles, Evidence, 10 March 2006, p55

<sup>86</sup> Mr Walshe, Evidence, 23 March 2006, p43

Walshe pointed out that the Cronulla sewerage treatment plant was the subject of a five volume EIS.<sup>87</sup>

**3.62** In response to these concerns, the Committee asked Mr Haddad during the hearing on 23 March 2006 whether, with the indefinite deferment of construction of the desalination plant, the critical infrastructure classification could be removed so that the proposal can go through a full EIS process.

**3.63** In response, Mr Haddad argued that essentially there is not much difference in the environmental assessment process for critical infrastructure and that for other major projects:

The critical infrastructure status does not substantially affect the statutory nor the project's policy assessment requirements. It does not mean that because it is critical infrastructure that there is no environmental assessment process, including exhibitions and consultations. There is no difference in the assessment process for a critical infrastructure project and other major projects. The major difference is that critical infrastructure projects do not attract appeals after the Minister has made the decision. Notwithstanding that, when a Minister constitutes a panel before a decision is made for any project there is no right of appeal after the decision is made. I am trying to highlight that process-wise it is very similar to any other project in terms of its being critical infrastructure.<sup>88</sup>

**3.64** The Committee subsequently wrote to Mr Haddad requesting advice on the process for declaring a project critical infrastructure and how these steps were applied in the case of the proposed desalination plant at Kurnell. In response, Mr Haddad advised:

A proponent would usually make a written request to the Department of Planning or the Minister that the project be declared critical infrastructure. This request would be supported by information from the proponent, outlining its arguments as to why the project is "essential to the State for economic, environmental or social reasons". The Department would consider this information and prepare a submission to the Minister either recommending that the project be declared to be critical infrastructure, or that the Minister form the opinion that it should not be declared.

If the Minister forms the view that the project is essential to the State for economic, environmental or social reasons, he could:

1) amend *State Environmental Planning Policy (Major Projects) 2005* to include the project in Schedule 5 – Critical Infrastructure Projects; or

2) make a specific declaration under section 75C of the *Environmental Planning and Assessment Act 1979*.

In the case of the Kurnell desalination project, the Minister amended the Major Projects SEPP to include the project in Schedule 5.<sup>89</sup>

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<sup>87</sup> Mr Walshe, Evidence, 23 March 2006, p46

<sup>88</sup> Mr Haddad, Evidence, 23 March 2006, p32

<sup>89</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Sam Haddad, Director General, DoP, Question 1

**3.65** The Committee also notes that the ability to either deliver the project in a timely manner or to deliver it quickly was one of the established criteria used to declare the project critical infrastructure in November 2005. Accordingly, the Committee questioned Mr Haddad whether that judgement is still valid, given it was announced in February 2006 that there is an extremely low probability that dam levels would fall below 30% at least until 2015. Mr Haddad provided the following written advice:

The criterion for declaration of a project as critical infrastructure is set by section 75C of the *Environmental Planning and Assessment Act 1979*. That is, if, in the opinion of the Minister for Planning, the project is essential for the State for economic, environmental or social reasons. The ability to deliver the project in a timely manner or to deliver it quickly were not a criteria applied as part of the Department's recommendation that the Minister declare the project to be critical infrastructure.<sup>90</sup>

**3.66** During the public hearing on 23 March 2006, Mr Haddad was also requested to make available to the Committee the basis for the Department's recommendation to the Minister that the Kurnell desalination project be declared to be critical infrastructure. The Director General took the question on notice and subsequently advised the Committee:

The Department of Planning recommended that the Minister declare the Kurnell desalination project to be critical infrastructure because it considered the project to be essential to the State for the following reasons:

Economic

- implications of reduced and rationed water supply to major commercial and industrial centres in the Sydney area;
- implications for Government and subsequently the public associated with importation of water to meet water supply shortfalls (for example, trucking water in from external catchments);
- implications of policing rationed water supplies and the potential for unlawful attempts to maintain water supply;
- implications of delaying a desalination option at this time, with resultant increases in cost to Government and the public should be delayed until some time in the future;

Social

- the potential implications of reduced and rationed water supply to essential social services, including hospitals, schools and fire fighting capabilities;
- the potential equity disparity associated with increased cost and reduced supply of water, such that some socio-economic groups may face increased difficulties in affording and accessing water supplies;
- the potential implications in the event that unsafe water supplies are accessed by the public to offset reduced and rationed potable water supplies;
- the potential implications of reduced water supplies for recreational uses (eg major sporting complexes);
- the security implications of relying on a single source of water; and

<sup>90</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Haddad, Question 5

Environmental

- the potential implications of extraction of water from external sources, with impacts at the extraction source and along transportation routes (both environmental and amenity impacts).<sup>91</sup>

**3.67** The Committee notes that one of the economic criteria for declaring the desalination plant critical infrastructure cited above was the issue of increased cost if construction was delayed. Page 12.1 of the EA notes that a 500ML/day desalination plant would cost in the order of \$2 billion. During the public debate on the desalination plant, the figure of \$1.3 billion was commonly associated with the cost of a 125ML/day plant. The February 2006 Progress Report on the Metropolitan Water Plan stated that the decision not to proceed with the construction of the plant until required would offer a significant financial saving, estimated to be close to \$1 billion, relative to proceeding immediately to build. The plan also noted that the actual construction and operation costs of a 125 ML/day scaleable plant would raise Sydney Water customer bills by about \$60 per year.

**3.68** The Committee requested advice on whether Sydney Water had done any projections on how much the cost of construction could increase over future years and on the flow-on cost to consumers if full cost recovery was sought. Sydney Water advised:

Sydney Water prepared an estimate in late 2005, of the total final cost of the project. It is difficult, however, to predict how costs will increase, or in fact decrease, into the future, due to the many variables beyond Sydney Water's control.

The cost of construction could increase over a number of years due to factors such as inflation and construction cost escalation, or decrease due to factors such as improvement in membrane technology or energy recovery.

It is therefore difficult to make a firm estimate of how costs will change over time.<sup>92</sup>

**3.69** The analysis report prepared by Professor Stuart White and Mr David Campbell, upon which the February 2006 Progress Report was based, argued in fact that a feature of delaying construction is that it may well allow a lower cost, less energy intensive plant to be built should the need arise.<sup>93</sup> The Committee heard that the possible reduction in costs that could be achieved in the future would accrue from hybridisation and co-location of plants rather than from technological advances.<sup>94</sup>

**3.70** The Committee deals with the environmental justification for the Department's recommendation to the Minister that the Kurnell desalination project be declared to be critical infrastructure in Chapter 7 of this report.

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<sup>91</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Haddad, Question from Ms Hale MLC

<sup>92</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 4, p4

<sup>93</sup> White S, Campbell D, *Review of the Metropolitan Water Plan*, Institute for Sustainable Futures, UTS & ACIL Tasman, February 2006, p18

<sup>94</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p65

## Greenhouse gas emissions

**3.71** The Committee received a number of submissions from local authorities and community groups that provided a comprehensive critique of the likely environmental impacts of the proposed desalination plant. One issue that drew comment from virtually all inquiry participants opposed to the desalination plant was that of greenhouse gas emissions. This issue also received consistent media attention during the period prior to the announcement of the deferral of construction of the plant.

**3.72** The EA was written to include the use of 50% renewable energy to power the desalination plant. However, many submissions argued that the greenhouse gas emissions generated by the desalination plant would only serve to exacerbate the environmental conditions that they believed were contributing to Sydney's low water storage levels. This general concern was typified in a comment made by Mr Ross Young from the Water Services Association of Australia:

... it is often said it would be the height of irony if our response to climate change and increasingly unreliable rainfall was to increase our greenhouse gas emissions ...<sup>95</sup>

**3.73** The Committee does note that in evidence to the Committee, Mr Young went on to caution that when assessing greenhouse gas emissions from a desalination plant compared to alternative schemes, it is important to compare full energy cost:

But when you look at energy and the cost of desalination versus recycled water, quite often the costs and the greenhouse gas emissions are only ever compared at the treatment plant gate. There is no doubt that desalination is much more intensive and much more expensive than recycled water at the treatment plant gate. But the thing is, with recycled water you have got to pump it such a long way and build such large pipe networks to get it back to the point where you can use it in meaningful quantities that the economics of it start to look completely different.<sup>96</sup>

**3.74** Nevertheless, there is no argument regarding the fact that seawater desalination is an energy intensive process. Chapter Six of the EA provided the following table which shows the operational energy greenhouse gas emissions for a 125ML/day and 500ML/day desalination plant using grid electricity and operating 365 days per year.

<sup>95</sup> Mr Young, Evidence, 20 March 2006, p51

<sup>96</sup> Mr Young, Evidence, 20 March 2006, p51

**Table 3.1: Greenhouse emissions<sup>97</sup>**

| <i>Desalination Plant Capacity</i>                                     | <i>125 ML/day</i> | <i>500 ML/day</i> |
|--|-------------------|-------------------|
| Electricity demand (megawatts)   | 30                | 110               |
| Electricity consumption (gigawatt hours/annum)                         | 225               | 906               |
| Emissions (tonnes CO <sub>2</sub> - e/annum)*                          | 240,000           | 950,000           |
| Emissions intensity (tonnes CO <sub>2</sub> /megalitre water produced) | 5.3               | 5.3               |

\* Emission factor for grid electricity 1.054 CO<sub>2</sub> per MWh (electrical).

**3.75** Associate Professor Greg Leslie from the School of Chemical Engineering at the University of New South Wales, who has been involved in a number of water strategies for different communities around the world, explained the desalination process and why it was so energy-intensive:

The best way to think of it is that when engineers design pumping systems they generally talk in terms of metres of lift, or metres of head, at which you need to pump the water. Because seawater is salty – it contains, on average, about 33,000 milligrams per litre of salt – when you begin to concentrate that against a membrane it creates an osmotic pressure which you have to pump against. The pumping head lift is around about 800 metres. It varies depending where you are on the globe. In the Middle East, for example the Arabian Gulf, the pumping head is much higher simply because the water is more saline. In parts of the Atlantic the water is less saline and warmer, so that the pumping head is lower.<sup>98</sup>

**3.76** Associate Professor Leslie advised that the energy cost associated with seawater desalination was between 4.5 and 5.5 kilowatt hours per cubic metre of water produced.<sup>99</sup> The Committee notes it also heard that some plants have been able to reduce this cost to as low as 1.8 kilowatt hours.<sup>100</sup> However, the figures given by Dr Leslie accord with those provided by Sydney Water in the EA – that is, 5.4 kilowatt hours per cubic metre of water produced.

**3.77** In response to these concerns about greenhouse gas emissions, in the February 2006 Progress Report on the Metropolitan Water Plant, the Premier made the commitment that a desalination plant, if built, would be powered by 100% renewable energy.<sup>101</sup>

**3.78** During the public hearing on 23 March 2006, Mr David Nemtzow, the Director General of the Department of Energy, Utilities and Sustainability, confirmed to the Committee that there would be enough renewable energy available for purchase to give effect to this commitment:

<sup>97</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, Table 6.1, p6.8

<sup>98</sup> Associate Professor Leslie, Evidence, 20 March 2006, p5

<sup>99</sup> Associate Professor Leslie, Evidence, 20 March 2006, p3

<sup>100</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p59

<sup>101</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p14

Before that commitment was made by Government we conducted vigorous analysis to make sure that resources were available. They are available. It is important to note that it is an offset. It does not necessarily mean that a wind farm will send electricity directly to a desalination plant. It will send it into the grid and it will be purchased by Sydney Water to offset completely the carbon dioxide emissions. We get the same result, but we have a multistate grid, which is the only way it works in reality. It is a real commitment, and it is technologically and financially well within control.<sup>102</sup>

**3.79** Mr Nemptzow subsequently provided the Committee with the following written advice on the availability of renewable and accredited green power:

During 2004-05 renewable energy sources in NSW are estimated to have generated more than 5800 GWh of electricity. The Snowy Scheme generated 4295 GWh, Shoalhaven Scheme 18GWh and Hume Hydro Scheme 111 GWh with the remainder being generated by various smaller wind, biomass, solar and coal seam methane plants.

During 2004 (2005 data not yet available), generation from accredited Green Power plants in NSW was 402 GWh and consumption through NSW Green Power sales was 175 GWh.

In addition to the available Green Power generation, there are numerous new plants with planning approvals or applying for same that would be available to supply new loads. These include:

- Snowy Plains Wind Farm (near Lake Eucumbene), has planning approval for 16 turbines (<30 MW)
- Crookwell II Wind Farm, has planning approval for 92 MW
- Taralga Wind Farm, has planning approval for 50 turbines (1.5 to 2MW each, totalling 75 to 100MW)
- Gunning Wind Farm, has planning approval for 32 turbines (62 MW)
- Ben Lomond Stage 1 Wind Farm, has planning approval for 12 turbines (20MW)
- Cullerin Wind Farm (30MW) development application lodged with Department of Planning
- Capital Hill Wind Farm, near Tarago (1322 MW) development application lodged with Department of Planning.

This is a total of over 400 MW of wind generation capacity that is proposed and under development. Less than 100 MW of this would be sufficient to supply a 125 megalitre a day desalination plant.<sup>103</sup>

<sup>102</sup> Mr Nemptzow, Evidence, 23 March 2006, p18

<sup>103</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr David Nemptzow, Director General, Department of Energy, Utilities and Sustainability, Question 1, p1

- 3.80** Mr Haddad was in turn asked whether the commitment to effectively power the desalination plant would become a condition of approval should the desalination plant ever be built. Mr Haddad advised that following review of the PPR, which will have to include details on how the 100% offset would be achieved, that he expected it to appear as a condition:

If the project is recommended for approval and approval is granted, then obviously we will have to lock in some of their critical key elements of impacts, and energy and greenhouse are obviously key elements so I expect them to appear somewhere as part of the conditions.<sup>104</sup>

### **Co-location of a power plant with a desalination plant**

- 3.81** The Committee notes that Chapter 6 of the EA includes sections on the comparative cost of co-locating a gas power plant with the proposed desalination plant. It also examined other renewable energy options.<sup>105</sup>
- 3.82** Table 6.3 from the EA entitled 'Renewable Energy Options' is reproduced over.

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<sup>104</sup> Mr Haddad, Evidence, 23 March 2006, p33

<sup>105</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, pp6.8-6.10

**Table 3.2: Renewable energy options<sup>106</sup>**

| Option                | Proven,<br>Large Scale<br>Technology             | For Power Plant*     |                              |   |
|-----------------------|--|----------------------|------------------------------|---|
|                       |  | Land<br>Requirements | Capitol Costs<br>(\$million) | Energy Cost** of<br>Renewable<br>Energy (\$/Wh) |
| Wind                  | Yes  | 1.5/6km <sup>2</sup> | \$140/\$560                  | 80-100  |
| Wave                  | No<br>(developmental)                            | Minimal              | \$71/MWh                     | >200  |
| Solar<br>Photovoltaic | No<br>(small scale)                              | 1.5/7km <sup>2</sup> | \$1,000/\$4,800              | 300-400+  |
| Solar Thermal         | No<br>(developmental)                            | 2/5km <sup>2</sup>   | \$250/\$700                  | 100-200   |
| Hydro Electric        | Yes<br>(limited small<br>scale<br>opportunities) | Project specific     | Project specific             | 50-200<br>(project specific)                    |
| Landfill Methane      | Proven<br>but small scale                        | Large                | Project specific             | 40-60   |
| Biomass               | Proven<br>but small scale                        | Project specific     | Project specific             | 60-100  |

\* First figure applies to 100 ML/day desalination plant (189 GWh/annum) and second figure applies to 500 ML/day desalination plant (906 GWh/annum).

\*\* Compared to grid power of \$53/MWh (excludes greenhouse gas mitigation).

- 3.83** Page 6.10 of the EA states that the only renewable energy option in Australia that is proven at a large scale is wind energy, however, the current cost of wind power precluded its use on this project.
- 3.84** The land requirements for a wind power plant for a 100ML/day desalination plant would be 1.5 square kilometres; capital costs would be \$140M and the cost of this energy would be \$80 to \$100 per MWh. This cost compares to the cost of grid power of \$53 per MWh. However, this grid power cost does not include the cost of any greenhouse mitigation.
- 3.85** Page 6.12 of the EA notes that green power currently sells for a premium of \$35-\$40/MWh over conventional energy, while table 6.2 (which compared the energy costs of a co-located gas power plant versus electricity from the grid) puts the cost of grid power when including costs of 50% greenhouse mitigation at \$67/MWh for a 100ML/day plant.
- 3.86** As indicated, the EA was written when it was proposed that the desalination plant would use only 50% renewable energy. In February the Premier announced that the plant, if built, would be powered 100% by renewable energy. This would obviously have increased the cost of powering the proposed desalination plant. It was reported that the annual cost of a 50% offset

<sup>106</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, Table 6.3, p6.10

was budgeted at \$100 million. Accordingly, the commitment to use 100% green power could double that cost, depending on the future cost of renewable energy.<sup>107</sup>

- 3.87** Given this increase in energy costs and the statement in the EA that it was the cost of wind power that precluded its use on this project, the Committee asked Sydney Water whether it should now reconsider a co-located wind power plant with the proposed desalination plant. Sydney Water advised that there was insufficient land to accommodate a wind power plant:

Co-locating a wind power plant on the site of the desalination plant at Kurnell is not included in the Concept Plan for which Sydney Water is seeking approval.

The site Sydney Water has acquired for the desalination plant is not large enough to accommodate a wind power plant. Co-locating a wind power plant is not considered feasible due to the lack of sufficient land in proximity to the desalination plant site.<sup>108</sup>

## Desalination plant ocean discharge

- 3.88** Along with greenhouse gas emissions, the other environmental issue that attracted general public comment was that of the discharge from the desalination plant into the Tasman Sea east of Kurnell. The discharge would consist mainly of elevated salinity seawater, backwash water from the pre-treatment filters and from the cleaning of the reverse osmosis membranes. The discharge will also contain any chemicals required for the pre-treatment of the feedwater. Collectively these are referred to as seawater concentrate.

- 3.89** The normal salinity of seawater is between 34 and 36 parts per thousand (ppt). At point of discharge the seawater concentrate would contain 65 ppt salinity plus the chemicals used in the process. The EA notes that adequate dilution of the seawater concentrate can be achieved in a relatively small mixing zone from the discharge point, the so-called 'near field', beyond which it has no affect on water quality or aquatic ecology. The Summary of the EA states that the near field mixing zone will be the area within 50 to 75 metres [in each direction] of the seawater concentrate outlet. The Summary document went on to state:

Modelling shows that adequate dilution of the seawater concentrate can be achieved in a relatively short distance from the discharge point ...

A range of parameters in the seawater concentrate was assessed. These included indicators such as pH, temperature, dissolved solids, iron, turbidity and nutrients. At the edge of the mixing zone, all parameters had returned to background levels. Chemicals used in the desalination process are not expected to have impacts on marine water quality due to the nature of the chemicals, dilutions achieved and decomposition in seawater. Toxicity testing of the seawater concentrate will be used to confirm the prediction that no significant impacts will occur at the edge of the mixing zone on aquatic ecology.

A marine monitoring program will also be implemented to identify any long-term impacts from the discharge of seawater concentrate on water quality or marine life.

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<sup>107</sup> 'City plan to drill streets for water', *The Australian*, 10 February 2006

<sup>108</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 5, p5

Comparisons of marine ecosystem quality will be made before and after commissioning of the desalination plant at reference sites and the seawater outlet.

There could be temporary consequences to whale watching during the construction period as the whales may avoid the area. As a result, they may be further offshore and not as visible from the shoreline.<sup>109</sup>

- 3.90** In response to the information in the EA Summary cited above, inquiry participants who closely reviewed the full EA document argued that there is currently little certainty about the effects of seawater concentrate on the receiving marine environment. For example, Dr Stuart Khan stated in evidence:

I also discussed briefly in my report the impact of discharge brine on marine ecosystems. Basically, the major point there is another lack of knowledge, as is acknowledged in the assessment, for the concept for the desalination plant. The ecology lab that prepared a report for GHD for the assessment indicated a severe lack of knowledge in regard to the potential impacts on marine organisms. The water research laboratory undertook some plume dispersion modelling, the point being that since the amount of impact was not able to be properly quantified, the approach would be just to disperse the saline brine as quickly as possible and again the water research laboratory in their report also indicated a large degree of uncertainty regarding near field dispersion. So there are many, many unknowns that we cannot pretend we know exactly what is going to happen with that brine.<sup>110</sup>

- 3.91** By contrast, however, Professor Sheikholeslami argued that there is ground for confidence that the impact of the seawater concentrate would be negligible:

There have been various studies on concentrate discharge, including a study by Western Australia. In addition a couple of studies have been published, one in May in the European *Desalination* journal, which indicates that a historical section in Spain has been conducting experiments and monitoring discharge for years – because they are living on seawater desalination in Spain – to make sure the concentrate discharge is not going to damage estuaries and marine life. There has been no detectable effect. There are studies that show swimming causes more interference, not damage, to marine life than seawater discharge. Seawater desalination discharge is a maximum of 50 per cent concentrate. There are many ways to reduce that from 50 per cent, just by different pumping, pumping more water, or diluting it and sending it back to the ocean.<sup>111</sup>

- 3.92** As indicated, the information contained in the EA Summary document simply states that the near field mixing zone will be between 50 to 75 metres of the discharge outlet. However, on perusal of the relevant section of the full EA document – Chapter 7 Assessment of Seawater Intake and Concentrate Outlet Project Components – it is apparent that the size of the near field mixing zone cannot yet be accurately predicted. This is because the EA assumes zero-

<sup>109</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, pxvi

<sup>110</sup> Dr Khan, Evidence, 20 March 2006, p12

<sup>111</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p59

current receiving waters.<sup>112</sup> However, the EA also notes that currents will be present in the receiving waters most of the time. This will result in the mixing zone being larger than the cited 50-75 radius from the discharge point – albeit with a plume that will be lower in concentration.

**3.93** The Committee wrote to Sydney Water requesting an explanation of the advantage of this conservative modelling approach as opposed to a model based on actual conditions – that is a larger but less concentrated mixing zone. Sydney Water advised:

During the planning study it was decided that any discharge from the plant would need to be diluted to background concentration as soon as possible to avoid potential impacts. The point where salinity returns to concentration within natural variation is defined as the edge of the near field.

The Roberts (1997) model has been developed for dense plumes and has since been validated by building a physical model and confirming behaviour of the discharge plume into stationary seawater. This model assumes discharges are into stationary seawater. This approach is considered “conservative” because the presence of currents will further aid dilution reducing the potential environmental impacts.

Although it is known that the discharges off Kurnell will be into moving waters, there had been no appropriate work on modelling into moving seawater, which could be used to estimate the dilution in the near field zone.

In reality the distance to the edge of the near field (and hence the size of the impact zone) will depend on the ocean currents passing the outlet. In stationary currents, the size of the impact zone will be smallest (as shown in Appendix A2 of the Environmental Assessment) and will be as low as one third of a hectare. However, discharging into stationary currents will also achieve the least dilution within the near field zone.

Discharging into moving currents will achieve greater dilutions of the plume within the near field zone. It is estimated that under these conditions the size of the mixing zone will be larger but the plume will be lower in concentration.

This modelling approach has been adopted as a starting point to derive estimates of the extent of the near field to form the basis of water quality and marine ecology assessments. Additional work will be undertaken during the detailed design phase to refine the model. This will be based on site-specific current survey data that will input to physical modelling of the discharge into currents.<sup>113</sup>

## **Impact on the Kurnell peninsular and local communities**

**3.94** At the public hearing on 23 March 2006, Mr Walshe from the Combined Community Groups of Sutherland Shire Council Concerned with Water-saving in Greater Sydney expressed concern that Kurnell has once again been earmarked for major industrial development, despite the existence of previous studies that advise against such action:

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<sup>112</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, p7.11

<sup>113</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 3, p3

The fact is, Mr Chairman, that no part of Sydney has been more studied, more worked over in the past 50 years, than has Botany Bay and its greatest adjunct, the Kurnell Peninsula. At this moment I will draw attention to only one such study, the one that was made in 2002-03 by the Government's Botany Bay Strategy Advisory Committee – at a cost, I may say, of \$800,000. It produced four large reports, all of which are now stamped, "Draft" and are lying in that draft state in the Department of Planning. I have brought them along just because I think their physical presence is of some importance. There are four big studies, all marked, "draft" and they are lying in the Department of Planning, awaiting finalisation.

In particular I draw attention to this very thick one which is titled, "Botany Bay Strategy – Kurnell Land Management Framework", which includes a draft action plan. This is tremendous material and I am saying, in effect, let the Government look at its own documentation at this stage. The intention of these and other forgotten studies was to warn again embarking on further major industrial development. After all, we have seen a refinery go up, we have seen an enlarged, expanded airport, we have seen of course the big container port which is now undergoing further expansion. Because of all that we are in no doubt that this proposed desalination plant will impact detrimentally on the ecology and heritage of Kurnell Peninsula.<sup>114</sup>

- 3.95** Mr Walshe told the Committee that the Aboriginal constituents of his alliance are opposed to further industrialisation of the peninsula, a process which they hoped had come to an end:

... Kurnell has always been a special place in the eyes of tribal people for hundreds of miles around there: a special place because of its extraordinary fauna, its abundant marine life and its much sought-after clays, all of which supported a relatively settled clan, the Gweagal people, part of the Dharawal tribe. Their elders tell us that they were horrified at the way the refinery was thrust on the peninsula in 1953. Now they are aware that the world's oil has peaked, so they are looking forward to the refinery being closed at some point in the not distant future and they greatly fear that an expensive desalination plant will install a much more lasting presence than the refinery.<sup>115</sup>

- 3.96** Mr Walshe advised the Committee that the alliance's policy preference for the 45-hectare desalination plant site is that the desalination plant be abandoned and the site turned over to the public, possibly as an addition to the adjacent Botany Bay National Park. Failing that, Mr Walshe stated:

... our second preference is that Sydney Water will maintain the site responsibly, managing site water effectively, keeping the site clear of weeds and caring especially for the health of the 15-hectare conservation zone, which is a precious, relatively unspoilt piece of bush-covered wetland. Need I add that we would be completely opposed to the Government selling off part or all of the site to private industrial development.<sup>116</sup>

- 3.97** In his evidence to the Committee, Mr Evans explained to the Committee why Kurnell was chosen as the site for the desalination plant in preference to Malabar, which was one of the other sites considered:

<sup>114</sup> Mr Walshe, Evidence, 23 March 2006, p42

<sup>115</sup> Mr Walshe, Evidence, 23 March 2006, p43

<sup>116</sup> Mr Walshe, Evidence, 23 March 2006, pp42-43

The adjacent land uses at Kurnell are things like Continental Carbon and the refinery, and if you have a look at the site it is out of sight and well away from residential areas. In contrast, Malabar is very close to and in the sight range of residential areas. So there is a multiple set of criteria for making the decision and those criteria have not changed.<sup>117</sup>

## Opportunities and issues regarding the desalination plant design

**3.98** During the inquiry, the Committee heard evidence on a number of issues to be considered when designing and locating desalination plants. These issues are discussed below.

### Intermittent operation

**3.99** During the public debate on the proposed desalination plant, it was announced that the plant would be operated as required and that there could be lengthy periods when it would not be operated. As noted previously, on 23 November 2005, the Premier announced that the desalination plant would be a publicly funded infrastructure project as opposed to a public-private partnership. This would give Sydney Water the flexibility to operate the plant as necessary without the risk of financial penalty.<sup>118</sup>

**3.100** It was reported in the media that desalination industry experts, including Mr Tom Pankratz, on whose advice the Government reportedly based its decision to proceed with the desalination plant<sup>119</sup>, were of the view that regularly shutting down a desalination plant would be a waste of money and could damage sensitive infrastructure.<sup>120</sup>

**3.101** This view was also shared by Professor Sheikholeslami:

A plant is like your car. When you operate, it runs. If you stop it, when you restart it it might give you some trouble. So it is the proper operational procedure to design something that is within your needs. Then you can run it 24 hours – around the clock. That is the proper way of operating.<sup>121</sup>

**3.102** The EA document, which was released on 24 November 2005, notes on a number of occasions that the desalination plant (particularly the 500ML/day option) could be non-operational for lengthy periods.<sup>122</sup> It is acknowledged that the EA does not reflect the subsequent Government announcements that the 125 ML/day plant would be the size of the plant and that it would be constructed only after dam levels fell to 30%. If such dire

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<sup>117</sup> Mr Evans, Evidence, 23 March 2006, p16

<sup>118</sup> Hon M Iemma, MP, Premier, 'Desalination Plant to be owned by the people of NSW', *Media Release*, 23 November 2005

<sup>119</sup> 'Desalination starts with murky water', *Sydney Morning Herald*, 4 December 2005

<sup>120</sup> Frew, W, and Moore, M, 'Murky Waters,' *Sydney Morning Herald*, 26 November 2005, <[www.smh.com.au](http://www.smh.com.au)> (accessed 13 December 2005)

<sup>121</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p61

<sup>122</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, p6.9

circumstances eventuated it would be reasonable to assume that the plant would need, at least in the first instance, to run continuously.

### **Routing discharge through existing sewage outfall**

- 3.103** During the public hearings, a number of witnesses indicated their understanding that the pilot plant will flush its seawater concentrate through the existing Potters Point ocean outfall.<sup>123</sup> This would have the effect of diluting the concentration of the discharge plume from the pilot plant.
- 3.104** The Committee notes that the purpose of the pilot plant is to inform the design of a fully operational plant. One of the issues that requires further study is the effect of the desalination plant's discharge on the receiving marine environment. If the pilot plant routes its concentrate discharge through the Potters Point outfall throughout the operational testing period, this would only be of value (in terms of assessing environmental impact) if it was intended that the desalination plant, if constructed, was also to route its discharge through that outfall.
- 3.105** The EA gives no indication that this configuration was being considered as part of the final design. The Committee acknowledges that this very well might be an action included within the Preferred Project Report.

### **Co-location with other industries**

- 3.106** In her evidence, Professor Sheikholeslami told the Committee that an increasing trend across the world was the co-location of desalination plants with power plants. This arrangement allows for the desalination plant to make use of the energy produced by the power plant in the desalination process.<sup>124</sup>
- 3.107** The Committee notes that this option was canvassed by Sydney Water in the EA document and discounted on what appears to be valid grounds.<sup>125</sup> The EA document went on to state that co-locating with other industries in the Sydney region also did not prove feasible at this time.
- 3.108** Professor Sheikholeslami also told the Committee that Kurnell was an ideal location for a desalination plant, precisely because she considered Kurnell to be an industrial site that would offer opportunities for cross-industrial processes.<sup>126</sup>
- 3.109** Professor Sheikholeslami went on to outline some of the alternative arrangements that she believed should be investigated, including the desalination plant using the discharge water from the Caltex refinery at Kurnell rather than using seawater. Professor Sheikholeslami

<sup>123</sup> Mr Ian Drinnan, Principal Environmental Scientist, Sutherland Shire Council, Evidence, 10 March 2006, p56; Professor Sheikholeslami, Evidence, 10 March 2006, p65

<sup>124</sup> Professor Sheikholeslami, Evidence, 10 March 2006, 59

<sup>125</sup> Sydney Water Corporation, *Environmental Assessment of the Concept Plan for Sydney's Desalination Project*, November 2005, p6.7

<sup>126</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p63

agreed that if the desalination plant were to be constructed, the Government should investigate whether it could work in conjunction with other industries in the Kurnell peninsula.<sup>127</sup>

### **Committee comment**

- 3.110** On 8 February 2006 the Premier announced that construction of the desalination plant had been deferred indefinitely. Construction is now dependent upon Sydney's water supply falling to 30% of dam capacity.
- 3.111** There appears to be general agreement that the likelihood of Sydney ever needing a desalination plant is small, even with acknowledged climatic uncertainty. However, the Committee notes that planning for and environmental assessment of the proposed plant is continuing.
- 3.112** In addition, construction of a pilot plant is under way. Given the continuing local concern and interest in what is happening at the plant and the apparent lack of information being provided to the local council and community, the Committee believes that Sydney Water should institute a regular liaison and information sharing process with local councils and community groups near the Kurnell desalination plant site.

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### **Recommendation 1**

That Sydney Water institute a regular liaison and information sharing process with the local councils and community groups near the Kurnell desalination plant site.

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### ***The Environmental Assessment***

- 3.113** The Committee believes it is fair to say that there is a general level of dissatisfaction with the lack of detail provided in the EA among the local authorities and communities who would be directly affected by construction of the desalination plant. Concerns were also expressed about the level of consultation during development of the EA.
- 3.114** In response to these issues, the Committee notes that many inquiry participants argued for the removal of the critical infrastructure classification for the desalination plant project and the conduct of a full EIS.
- 3.115** The Committee majority agrees with this position and believes that the desalination plant should no longer be classed as critical infrastructure. The Premier's message in the February 2006 Progress Report on the Metropolitan Plan noted that the recent advice he had been given had given him confidence that Sydney was now in a position to secure its water supplies in the face of severe drought – and even potential climate change impacts – and has more than enough water to meet its normal growth needs for the next ten years. It is therefore hard to imagine that DoP would at this time reiterate its recommendation of November 2005 that the desalination plant be classified as critical infrastructure.

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<sup>127</sup> Professor Sheikholeslami, Evidence, 10 March 2006, p64

- 3.116** Given the Government's assurances of the security of Sydney's water supply in the medium term, the Committee majority believes that the Minister for Planning should remove the critical infrastructure status from the Kurnell desalination project.

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**Recommendation 2**

That the Minister for Planning remove the critical infrastructure status from the Kurnell desalination project.

- 3.117** The Committee minority believes that the critical infrastructure designation is still needed, because it is important to ensure that the desalination readiness strategy is implemented as soon as possible, and that the necessary approvals are in place to enable any construction to be initiated in the event that dam levels fall to below about 30%.

***Environmental issues***

- 3.118** The Committee welcomes the Government's commitment that a desalination plant, if built, would be powered by 100% renewable energy. The Committee notes that a 125 ML/day desalination plant, if using conventional energy supplies, would likely increase greenhouse emissions by approximately 240,000 tonnes of CO<sub>2</sub> equivalents annually.
- 3.119** However, the Committee notes that in using power from 100% renewable sources, the renewable energy available to the rest of the state is diminished. While the Committee accepts the evidence of Mr Nemptzow that spare green energy capacity currently exists in New South Wales, this may not be the case in the future. Accordingly, the Committee believes that the Government should develop additional green energy generation capacity equal to the demand of a desalination plant, if it is ever built.

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**Recommendation 3**

That the Government commit to developing additional green energy generation capacity equal to the demand of the desalination plant, if it is ever built.

- 3.120** Following on from this recommendation, the Committee also explored the options for powering the desalination plant through the co-location of a wind power plant. Based on the evidence before it, the Committee recognises that there is insufficient land at the Kurnell site to power a 250 or 500 ML/day plant, however, the information provided in the EA would suggest there is sufficient land for a wind power plant to power a 125 ML/day plant.
- 3.121** The Committee is not in a position to be able to make a recommendation that if a desalination plant is constructed at Kurnell that its approval conditions should include the co-location of a wind-power farm or some other renewable energy plant. However, given the importance of increasing renewable sources of energy, the Committee is of the view that the development of a wind power plant should remain an option.
- 3.122** In relation to the issues of seawater concentrate discharges from the desalination plant, the evidence before the Committee from Dr Khan and Professor Sheikholeslami indicates that

the EA includes insufficient information on the impact of the discharge on water quality and aquatic ecology.

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#### **Recommendation 4**

That Sydney Water develop, undertake and include in the Environmental Assessment (or replacement document) further analysis on the impact of seawater concentrate discharges on water quality and aquatic ecology.

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- 3.123** The Committee minority believes that the impact of the seawater concentrate discharges on water quality and aquatic ecology was adequately addressed in the Environmental Assessment.

#### ***The management of the Kurnell site***

- 3.124** The Committee notes that, on the basis of the evidence it has received and of the announcements of the Government, it would be anticipated that Sydney Water will assume a care-taker role of the Kurnell site for some time. The submission and the evidence of the Combined Community Groups of Sutherland Shire Concerned with Water Saving in Greater Sydney provide a wealth of invaluable detail on the intricacies of the ecology of the Kurnell peninsula and how it is being affected by current industrial use and development. The knowledge of this alliance of groups is a resource that should be made use of by Sydney Water.
- 3.125** The Committee shares the view of the Combined Community Groups of Sutherland Shire that the Government needs to revisit its own documentation and develop a confirmed strategy for the ecology of the Botany Bay/Kurnell area.

#### ***Co-location with other industries***

- 3.126** The Committee heard evidence that Sydney Water did not undertake sufficient examination of alternative or innovative approaches with respect to the design of the proposed desalination plant in its EA. It was also suggested that little or no consultation was undertaken with industry experts on what could feasibly be achieved, including opportunities for accepting and making use of waste water from nearby industrial plants.<sup>128</sup> The PPR to be completed and released by Sydney Water may very well display a more innovative approach.
- 3.127** On the other hand, the Committee also heard that opportunities for accepting and making use of waste water as part of the desalination plant may be limited. The proposed desalination plant contains a suite of treatment devices, including membranes, which are designed to remove particulate substances in a certain quality of input water. When the quality of input water is varied, the treatment system may produce a variable quality of potable water.

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<sup>128</sup> Evidence, 10 March 2006, pp66-67

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**Recommendation 5**

That, as part of the planning process for the desalination plant, Sydney Water undertake and report on opportunities for accepting and making use of waste water from nearby industrial plants.

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- 3.128** The Committee minority notes the technical difficulties associated with such a proposal and notes that the Government has recently announced a new scheme for use of waste water with Kurnell industrial users.

## Chapter 4 The supply of water to Sydney

Throughout this inquiry the Committee heard of a range of options to both increase the supply of water to Sydney and decrease the amount of potable water used for purposes other than drinking. Key suggestions were water recycling, different methods of water reuse or using water more efficiently, through recycling water or using greywater, the use of groundwater supplies and rainwater tanks, improved collection of stormwater as well as deep storage projects in the Warragamba and Nepean dams.

As noted in the introduction to the Metropolitan Water Plan 2004 no single option is sufficient by itself. The challenge is determining the timing and sequencing of options to deliver the best social, economic and environmental outcomes for the community.<sup>129</sup> Many witnesses to the inquiry highlighted the importance of water saving alternatives to the proposed construction of the desalination plant, especially recycling.

### Water recycling

- 4.1** Of all the water supply alternatives open to government, water recycling was the one most frequently discussed by witnesses to this Inquiry. The term water recycling is defined as ‘the reuse (after appropriate treatment) of water from different sources (mixed wastewater, stormwater, greywater, urine and blackwater) that otherwise would be discharged to the environment.’<sup>130</sup>
- 4.2** In his submission, Dr Stuart Khan, Research Fellow at the Centre for Water and Waste Technology at the University of New South Wales, noted that the amount of water used for consumption and food preparation or for bathing, typically constituted 28% of a household’s water use. This leaves approximately two thirds of potable household water that could possibly be replaced by recycled water.<sup>131</sup>
- 4.3** By contrast, the 2006 Metropolitan Water Plan noted that 42% of water used in the household needs to be of potable quality (shower, kitchen, bathroom taps and dishwasher).<sup>132</sup>
- 4.4** The February 2006 Progress Report on the Metropolitan Water Plan 2004 also noted the importance of recycling water initiatives to the achievement of a sustainable and secure water supply for Sydney.<sup>133</sup> Mr David Evans, Managing Director of Sydney Water, advised the Committee that Sydney Water currently recycles approximately 15 gigalitres of water and that

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<sup>129</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p2

<sup>130</sup> Tangsubkul N, Moore S, Waite T, ‘Incorporating phosphorus management considerations into wastewater management practice,’ *Journal of Environmental Science and Policy*, 2005, Vol 8, pp1-15, <[www.sciencedirect.com](http://www.sciencedirect.com)>

<sup>131</sup> Submission 22, Dr Khan, p12

<sup>132</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p68

<sup>133</sup> NSW Government, *February 2006 Progress Report: Securing Sydney’s Water Supply, Metropolitan Water Plan*, 8 February 2006, p5

by involving industry in water reuse schemes, Sydney Water is expecting the amount of recycled water to double over the next few years.<sup>134</sup>

4.5 The Government anticipates that, as a result of measures to increase the amount of water being recycled, by 2015 Sydney's total recycled water volume will be increased to 70 gegalitres.<sup>135</sup> The initiatives to increase the amount of water currently being recycled, include:

- recycling in Western Sydney
- recycling in established parts of Sydney
- regulatory reform to support small scale recycling.

#### ***Western Sydney recycled water initiative***

4.6 Under the Western Sydney recycled water initiative, the Government plans to develop an Advanced Treatment Plant which will take water from three existing sewerage treatment plants at Penrith, St Marys and Quakers Hill. This recycled water will then be available to replace water currently released from Warragamba Dam, for industrial and agricultural purposes and for non-drinking purposes in the home.<sup>136</sup>

4.7 An Expression of Interest will be issued to the market in June 2006 for these two projects.<sup>137</sup> The May 2006 Metropolitan Water Plan states that when this scheme is completed, 'all of the treated effluent currently being discharged by the major Western Sydney sewerage treatment plants will be fully allocated to productive uses'.<sup>138</sup>

4.8 The Committee did not hear a great deal of evidence concerning this proposal. The need to ensure adequate environmental flows to the Shoalhaven and Hawkesbury-Nepean rivers was, however, highlighted in evidence.<sup>139</sup> The issue of river health and environmental flows is addressed in Chapter 6.

#### ***Recycling in established parts of Sydney***

4.9 The 2006 Progress Report also highlighted more localised initiatives planned for areas such as Kurnell, Botany, Parramatta, Wollongong and the Royal Botanic Gardens. For example, the Government plans to establish a recycled water project at Camellia for industrial water users. The Government estimates that, when established, this scheme could save up to six gegalitres of potable water every year.<sup>140</sup>

<sup>134</sup> Mr Evans, Evidence, 23 March 2006, p13

<sup>135</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p31

<sup>136</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p6

<sup>137</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p6

<sup>138</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p35

<sup>139</sup> Submission 134, Shoalhaven River Alliance, p8, and Mr Ian Kiernan, Executive Chairman, Clean Up Australia Ltd, Evidence, 10 March 2006, p3

<sup>140</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p7

- 4.10** Many inquiry participants also raised the use by industry of recycled water instead of potable water. While the majority of these initiatives are still in their infancy, the Committee addresses the potential for private sector involvement in recycled water initiatives later in this Chapter.

### *Regulatory reform*

- 4.11** The Government plans to amend current legislation relating to the recycling of water at a household level. For example, householders will no longer have to seek council approval for using their greywater to water the garden. Standardised operating guidelines will also be developed and the Government has flagged the creation of a lead agency, to coordinate ‘the large number of councils and water utilities that have regulatory responsibility for installation and operation of these systems’.<sup>141</sup>

- 4.12** Mr David Nemptzow, Director General of the Department of Energy, Utilities and Sustainability, advised the Committee of the progress of the new regulatory agreement:

There will be soon a new code of plumbing regulation ... It will affect the issues of rainwater tanks and of grey water and also the guidelines I referred to earlier. It is a series of changes to the regulations that we are progressing in government and that we are assisting the councils with, as well as the cultural, household and business changes ...<sup>142</sup>

- 4.13** Mr Ryan Fletcher, Director, Policy and Research, Local Government and Shires Association of New South Wales, discussed the effect of loosening these regulations on householders, from a local government perspective:

... under those plans householders will no longer need to obtain council approval for directly diverting grey water use to gardens and most small water recycling projects will no longer require an environmental impact statement [EIS]. That is the extent of the easing of those restrictions, as we understand it at this point. We are currently having further discussions with the appropriate regulators and central agencies concerning the development of those regulations.

But it should not be forgotten that there may be significant scope for a stronger nexus between recycling water initiatives and water savings measures, and anything that the associations can do to promote that nexus we will be doing in further discussions that we have with the different regulators.<sup>143</sup>

- 4.14** Witnesses also noted the importance of enhanced monitoring of these initiatives to ensure consumers adequately maintained and operated their water saving devices. The Committee addresses the need to monitor the use of rainwater tanks and other domestic water reuse mechanisms further in this chapter.

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<sup>141</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p7

<sup>142</sup> Mr Nemptzow, Evidence, 23 March 2006, p21

<sup>143</sup> Mr Fletcher, Evidence, 10 March 2006, p28

## Water recycling in the future

- 4.15 There are a number of ways in which recycled water may be introduced into the Sydney Water system. The Committee heard that the key methods of reuse are:
- potable reuse, or treating water to a standard for drinking
  - indirect potable reuse, or treatment of wastewater before it is ‘shandied’ or mixed into the usual drinking supply
  - non-potable reuse, where wastewater is treated and used for purposes other than drinking, such as flushing toilets, watering gardens, or industrial purposes.

### Potable and indirect potable reuse

- 4.16 Recycled water is not currently used for potable purposes in New South Wales.<sup>144</sup> Around the world, to use treated water for potable purposes, the water is generally pumped back into the environment where it is mixed with the untreated drinking water supply, before progressing through the usual process of drinking water treatment and provision.<sup>145</sup> This method of treatment and supply of recycled water is called indirect potable reuse, reflecting the water’s reintroduction into the environment and integration with the untreated water supply, usually in dams and reservoirs. The Committee is not aware of the existence of a ‘closed system’ in which wastewater is treated and supplied directly back to the community for consumption, however indirect potable reuse is a method used around the world.<sup>146</sup>
- 4.17 In terms of implementing an indirect potable reuse system in New South Wales, Professor Charles Essery, an independent water consultant, told the Committee that he believed that introducing treated wastewater into Warragamba Dam would not only add to the supply of water in the dam, it would improve the water quality stored there as the treated water was cleaner than the water naturally occurring in the dam:

We could forget stormwater, we could forget rainwater, we could forget groundwater and just do indirect potable because the water that would come out of a treatment plant that would take the effluent from Malabar and put it back into Warragamba Dam, that water would be cleaner and safer than the water that is currently sitting in or entering Warragamba Dam. You actually would be cleaning the dam up by putting that effluent back in there.<sup>147</sup>

- 4.18 Associate Professor Greg Leslie from the School of Chemical Engineering, University of New South Wales, told the Committee that, based on his experiences in California, where significant water recycling is undertaken, the costs of recycling water and pumping it back to a major supply dam as far away as Warragamba could be prohibitive:

<sup>144</sup> Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region: Final Report*, October 2005, p69

<sup>145</sup> Mr Ross Young, Executive Director, Water Services Association of Australia, Evidence, 20 March 2006, p49

<sup>146</sup> Associate Professor Greg Leslie, School of Chemical Engineering, University of New South Wales, Evidence, 20 March 2006, p3

<sup>147</sup> Professor Essery, Evidence, 10 March 2006, p19

In California, getting it back into the environment, where I worked, meant getting it back into the ground. That was attended by modest pumping costs. To that 120 to 200 metres of head [energy required to treat and pump waste water], it would probably add about 40 metres of head. In Singapore, because of the topography of the island – the highest point is only about 45 metres above sea level – obviously, it does not take a lot of energy to lift it.<sup>148</sup>

**4.19** Associate Professor Leslie then went on to explain that Sydney’s geography and the relative location of Warragamba Dam meant that treated wastewater would have to be pumped approximately 80 kilometres in order to mix it with the drinking supply in the dam. He estimated that, compared to the 240 meters of head lift, or energy required to transport the water to the drinking supply in California, it would require ‘anything from a 300 to 600 meter head lift’ to transport the treated wastewater to Warragamba from Sydney, where the wastewater is produced.<sup>149</sup>

**4.20** Nonetheless, Associate Professor Leslie noted that water in a dam stores energy and that some energy could be recovered from the use of a turbine, which already exists at the bottom of Warragamba dam. He believed such a turbine could recover approximately half the pumping costs:

... our estimates were that to get the water to the standard that you would need say at a facility like the Malabar treatment plant, and pump it back to the catchment behind Warragamba at a place called Nattai, you are looking at about 3.8 kilowatt hours per cubic metre of water produced and delivered. It still compares favourably with the numbers that are on the Sydney Water web site for desalination, which is around about 5.4 kilowatt hours per cubic metre.

...

... over the course of a year it is a significant amount of energy and attendant greenhouse emissions. A reasonable turbine at the base of Warragamba – which exists, but is not used – would recover about half of the pumping costs, or around about a kilowatt hour, so that would bring it down to about 2.8 or 2.4.<sup>150</sup>

**4.21** However, opportunities to recover energy at Warragamba Dam are limited. The hydro electricity plant at the dam, owned by Eararing Energy, is able to commence operation when Lake Burragorang rises to a level of minus one metre below full storage level (that is, it can operate only when the dam is spilling or close to spilling). Once water enters the plant, it is released into the Warragamba River and cannot be used as part of Sydney’s drinking water supply.<sup>151</sup>

**4.22** Mr Evans in turn noted the cost of a large scale water reuse process that transported treated wastewater back to Warragamba from Sydney. He estimated that the pipes required to push the water back to Warragamba would cost approximately \$1 million to build, but that ‘any one scheme will have different costs depending on all sorts of technological and engineering

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<sup>148</sup> Associate Professor Leslie, Evidence, 20 March 2006, p5

<sup>149</sup> Associate Professor Leslie, Evidence, 20 March 2006, p5

<sup>150</sup> Associate Professor Leslie, Evidence, 20 March 2006, pp5-6

<sup>151</sup> <[www.sca.nsw.gov.au/dams/hydro.html](http://www.sca.nsw.gov.au/dams/hydro.html)> (accessed 7 June 2006)

issues'.<sup>152</sup> Mr Evans told the Committee that in his view, the recycling schemes outlined in the 2004 Metropolitan Water Plan were the most cost effective and there was no need at this stage to progress to the more expensive options of pumping recycled water back to Warragamba Dam, however:

... in the future with technological changes all sorts of things might change and you never rule anything out. But you have to be careful about committing to things that impose a high cost on the community without the benefits being there.<sup>153</sup>

- 4.23** Mr Leigh Martin, Urban Campaigner from the Total Environment Centre, advised that another indirect potable alternative was available to New South Wales using the Prospect reservoir instead of the Warragamba Dam. He argued that a series of sewerage treatment plants in Sydney's west were treating wastewater to a tertiary standard and that in his opinion, it would be 'a relatively simple matter to treat this water to bring it to drinking water quality'.<sup>154</sup> From that point Mr Martin suggested:

Quite simply, you could mix it with Prospect's water and the simple upgrade of membrane filtration technology at the Prospect water filtration plant would then make that water drinkable.<sup>155</sup>

- 4.24** Associate Professor Leslie also agreed with this suggestion, noting that water could be pumped from the coast to Prospect using significantly less energy than transporting water all the way to Warragamba.<sup>156</sup> Associate Professor Leslie also added that, if indirect potable reuse were to be considered on a large scale, it had been his experience that the treated water was more adequately stored separately to the usual water supply and integrated from this storage facility. He argued this gave the facility an added protection against any contaminants being found in the treated water supply:

... one of the things that drives regulations and drives the thinking of health departments, particularly in California, is that if something ever goes wrong – not so much from an acute risk, about people getting sick, because that is more than adequately covered, but from some unknown organic contaminant – by putting it back into your regular water supply you have contaminated that supply. Putting it into an impoundment that can be taken off line is actually the best way.<sup>157</sup>

- 4.25** Associate Professor Leslie noted that as the Government has already built a wastewater treatment plant it was a logical step to build the piping to carry the water to the Prospect reservoir. He noted that the costs of such a scheme are approximately half of the costs associated with the desalination plant and approximately one fifth of the required energy for the same quantum of water.<sup>158</sup>

<sup>152</sup> Mr Evans, Evidence, 23 March 2006, p18

<sup>153</sup> Mr Evans, Evidence, 23 March 2006, pp19

<sup>154</sup> Mr Martin, Evidence, 10 March 2006, p41

<sup>155</sup> Mr Martin, Evidence, 10 March 2006, p41

<sup>156</sup> Associate Professor Leslie, Evidence, 20 March 2006, p6

<sup>157</sup> Associate Professor Leslie, Evidence, 20 March 2006, p6

<sup>158</sup> Associate Professor Leslie, Evidence, 20 March 2006, p6

- 4.26** However, Dr Khan advised the Committee that treating water to the extent required for indirect potable reuse may be an expensive method of conserving water, particularly when compared to recycling water for agricultural uses, in which nutrients in the water did not have to be removed, but were of benefit to the plants and soil:

Indirect potable in some ways might be considered an ideal reuse approach because it means delivering water to one destination and having this one reservoir, or whatever, to retain the water and to treat it and put it back through the entire supply without having to implement a lot of major extra infrastructure. However, I wonder whether it really is the ideal approach in all circumstances. For example, it is a high-energy approach; it requires high treatment. All of that phosphorus and nitrogen that we are talking about discharging out of the outfalls has to be removed for indirect potable reuse. However, if we are looking at agricultural uses, maybe we can make use of some of the nutrients that are already in that water and not need to invest so much energy in upgrading it to a potable standard.<sup>159</sup>

- 4.27** Recycling treated water for agricultural purposes is considered later in this chapter. Dr Khan also notes that the infrastructure requirements of 'large scale water reuse in Sydney' are a key consideration of these measures.<sup>160</sup> Instead, Dr Khan suggests that a number of smaller treatment stations, established at intervals along the water treatment and supply route may be a more effective method of treating and supplying water for water reuse. He advised the Committee that sewerage treatment plants along the Georges River, at Glenfield and at Liverpool, produce a minimum of 37 megalitres per day of secondary treated sewerage.<sup>161</sup> He suggests that instead of this water being reintroduced into sewers and sent to Malabar, where it is discharged into the ocean, that it could be treated to a slightly higher level and recycled:

At the moment Sydney Water has a scheme that they are about to start implementing this year called the Southwest Sydney Sewerage Scheme and that involves building a 24-kilometre pipeline from Liverpool to Ashfield. That is going to take the sewage that is secondary treated, or greater, to Ashfield so that that will free up some of the flow in the north Georges River sub main to allow development in that area and increased capacity of that sub main. When Sydney Water talked about this they said that that pipe has the potential for maybe a sewerage reuse scheme sometime in the future, or whatever, but I think that before the pipe starts being built we really need to look at who can use that sewerage and we need to make sure that that pipe is planned and built with whatever requirements, in terms of pressure or flow or in terms of access to that pipe; that it is built optimally for industries between Liverpool and Ashfield to tap into it and be able to use it. Our aim should be for nothing more than a trickle of that secondary treated water to actually make it to Ashfield.<sup>162</sup>

- 4.28** Acknowledging these kinds of suggestions, Mr Nemptzow, Director General of the Department of Energy, Utilities and Sustainability told the Committee that whilst he believed that Sydney's water management bodies were performing effectively, he also believed there was scope for improvement:

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<sup>159</sup> Dr Khan, Evidence, 20 March 2006, pp12-13

<sup>160</sup> Submission 22, Dr Khan, p14

<sup>161</sup> Dr Khan, Evidence, 20 March 2006, p14

<sup>162</sup> Dr Khan, Evidence, 20 March 2006, p14

Can we do better? Yes. Would we like to recycle it and to use the stormwater more? Yes. But for reasons we have talked about today and I know your Committee has looked at, there are limitations to that – engineering limitations, pumping water uphill, social and financial limitations. I guess I would just describe it as progress and I think it is in the right direction. I think the pace is pretty good, but there is more to go, a lot more left.<sup>163</sup>

### *Community acceptance*

- 4.29** A key issue raised in relation to the introduction of potable and indirect potable recycling was that of community acceptance. If people are not prepared to have treated wastewater available for drinking purposes, there is little use in proposing the use of recycled water as an alternative to other sources of water. Community opposition has been one of the key reasons the Government has not pursued this option. As Mr Evans noted, Sydney Water, being a monopoly community service, provides its service in a way that it believes is acceptable to the broad majority of the community:

Unlike the normal business, where you can say, “I am producing for this market segment only and as long as they are happy they will pay me and I will go home,” in the case of monopoly services like water, you are providing services for everybody, and you are charging them all the same. Therefore the things you do have to reflect a reasonable consensus of the broad view.<sup>164</sup>

- 4.30** Professor Essery told the Committee that, in his opinion, negative publicity had been generated in relation to the use of recycled water, that he called the “yuck factor”. Professor Essery told the Committee that in 1995, Sydney Water had produced an internal report that demonstrated that ‘most people realise that indirect potable was, while unpalatable, inevitable’.<sup>165</sup> Professor Essery continued:

While we only hear from Mr Sartor of the 2003 review he had done, he does not realise that a document in the Sydney Water library shows 10 years of previous reports, which showed that the only reason people are against recycled water is post the crypto crisis. Given the mismanagement that occurred during that whole process, no wonder people are that way inclined.<sup>166</sup>

- 4.31** Mr Terry Barratt, Chair of the Shoalhaven River Alliance, noted that community education could contribute substantially to a community’s acceptance of potable recycling initiatives:

Our view is that we could have another water factory, take people through in an educative process, take the politicians through who say, “We can’t drink toilet water” so they can understand this issue. We could all be educated and we could all become much more comfortable with the concept. You could claim water from any of the treatment plants in any way you wanted to get it to Prospect, where it would then go through yet another treatment system before it hit the reticulation system for Sydney.

<sup>163</sup> Mr Nemptzow, Evidence, 23 March 2006, p22

<sup>164</sup> Mr Evans, Evidence, 23 March 2006, p9

<sup>165</sup> Professor Essery, Evidence, 10 March 2006, p19

<sup>166</sup> Professor Essery, Evidence, 10 March 2006, p19

Keep in mind that what was arriving at Prospect would be of better quality than the water coming from Warragamba Dam.<sup>167</sup>

- 4.32** Associate Professor Leslie told the Committee that from his experience in California, a series of presentation groups, targeting particular members of the community, was an effective way to gain community acceptance of the process of sewerage treatment for potable reuse. Associate Professor Leslie advised that the public affairs department of the Orange County water district conducted approximately 350 community presentations to groups such as parents and citizens groups, surfers and medical associations to deal with particular concerns. He believed that these presentations addressed the multitude of reasons behind the development of a water recycling system and that this would not have been possible through a blanket advertising campaign that may not directly engage the community:

You really need to get in there and explain why you are doing the project – and it is not just to recycle water, as it was in California. We were doing it because they did not want to build another ocean outfall; we were doing it because we did not want to import more water from northern California and mess up the habitat for the fish and the birds; we were doing it because it was cheaper than desalination and that was the other alternative and it was going to have less impact on the typical family's bill. So you really need to find the suite of messages that resonate with different groups.

...

The issues were emotional and you cannot overcome those emotional issues with technical information in 30 seconds; it has to be overcome with an equally powerful and innovative reason, such as saving the fish or stopping pollution in the ocean.<sup>168</sup>

- 4.33** Mr Ross Young, Executive Director of the Water Services Association of Australia, noted the difficulties of Sydney's geographic location in terms of this method of reusing wastewater, but noted that indirect potable reuse had an important role in disassociating the origins of the treated wastewater in the public mind:

From a public perception point of view, it loses its identity, so it becomes a much more acceptable product. It is incredibly difficult to do that in a city like Sydney, when you think the only option you have to provide that detention time and for the recycled effluent to lose its identity is to pump it all the way back to Warragamba, which is a very long way to pump it. Whereas in places like Perth they are investigating putting it down into their aquifers, where they can give it detention time.<sup>169</sup>

### **Non-potable reuse**

- 4.34** There are a number of possible alternatives or ways in which metropolitan Sydney can reuse water for non-drinking purposes. These include, domestic or onsite municipal reuse, municipal irrigation, dual reticulation systems for household reuse and industrial reuse.<sup>170</sup>

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<sup>167</sup> Mr Barratt, Evidence, 23 March 2006, p53

<sup>168</sup> Associate Professor Leslie, Evidence, 20 March 2006, p10

<sup>169</sup> Mr Young, Evidence, 20 March 2006, p49

<sup>170</sup> Submission 22, Dr Khan, pp10-11

*Domestic reuse*

- 4.35** Domestic reuse generally refers to the collection of greywater from laundries and showers, subjected to a moderate filtration process, for reuse on gardens and in flushing toilets.<sup>171</sup>
- 4.36** Dr Khan advised the Committee that on-site reuse was a valuable method of reusing greywater from showers and washing machines. He estimated that approximately 30% of household water is used for horticultural purposes and another 10% used for flushing toilets and that therefore, almost half the water consumed by a household may be replaced with non-potable water, ‘without really getting into areas which would involve too intimate human contact’ with the treated water.<sup>172</sup>
- 4.37** Professor Nicholas Ashbolt, Head of School of Civil and Environmental Engineering at the University of New South Wales, was similarly supportive of the use of greywater for non-potable domestic uses and explained that an alternative to the current subsidies for recycling devices and rainwater tanks was to engage the private sector to produce greywater recycling devices. He suggested that contracting out this responsibility would allow Sydney Water to relinquish responsibility for the maintenance and installation of these devices, saving costs and encouraging their proper use:

Most people will not want to spend \$6,000 for a grey water recycling system for their own home and, perhaps, why should they? They do not contribute upfront costs for the sewer pipes and other things that mean being connected to the sewer in the same way. So the lost opportunity here is to work with the companies that can produce these devices and the agencies that can maintain in the long term the functionality of those devices.

The other advantage is that it gives enormous flexibility. These devices may last 15 to 20 years; they will be naturally serviced, but after that time they can be upgraded with the latest technology. We do not have that opportunity with large desalination and other types of plants. Those structures are in place for a lot longer and there are a lot more upfront costs there.<sup>173</sup>

- 4.38** This issue of contracting out the maintenance and installation of rainwater tanks is further examined later in this chapter, along with the use of rainwater tanks generally.
- 4.39** However, Dr Noel Merrick of the Groundwater Institute at the University of Technology, Sydney, advised the Committee that use of greywater for watering gardens had to be treated with some caution as this water would eventually sink down to the water table, possibly compounding problems associated with the naturally salty waters of the Cumberland Plain:

I mentioned grey water because we have done a bit of work on it. Grey water when used for irrigating gardens and lawns is effectively pouring water onto the water table. Again, you have to be careful not to do it where you have an incipient salinity problem. It can save a lot of home water demand problems. I am sure you have had other people talk about problems with detergents.

<sup>171</sup> Submission 22, Dr Khan, p10

<sup>172</sup> Dr Khan, Evidence, 20 March 2006, p16

<sup>173</sup> Professor Ashbolt, Evidence, 20 March 2006, pp30-31

From a geological perspective, you cannot use it everywhere. You have to be conscious of the soil type. It is not suitable in clay soils, it is not suitable where you have rock very close to the surface and it is not suitable where you have land that slopes in excess of 10 degrees because water will run off onto the neighbour's property and will eventually pool at the bottom of the street.<sup>174</sup>

- 4.40** Dr Merrick cites studies that indicate that only 25% of the Sydney metropolitan area was suitable for disposal of greywater on sandstone soils, rather than the shale plain making up the majority of the Cumberland region. However, Dr Merrick did note the possibility that in the remaining 75% greywater could still be used, but in a 'closed system' in which greywater was stored in a tank and then used to flush toilets, rather than for watering the garden.<sup>175</sup>
- 4.41** The May 2006 Metropolitan Water Plan advises that the Government intends to amend the Local Government (general) Regulation 2005 so that most direct greywater diversion (to the garden) is exempt from local government approval.<sup>176</sup> The exemption from council approval is only for the direct diversion of greywater for garden usage under certain conditions, which represents a very low risk undertaking in terms of health and environmental impacts.

### *Municipal irrigation*

- 4.42** Municipal irrigation refers to the use of secondary or tertiary treated effluent to water parks and playing fields.<sup>177</sup> This type of reuse is one of the methods used by the Sydney Olympic Park Authority at their development at Homebush and by a number of councils around the state of New South Wales.
- 4.43** Albury City Council and Albury Water have developed a number of water treatment and reuse schemes for municipal purposes. Currently, Albury treats approximately 5,000 megalitres of wastewater annually, which is then used to irrigate almost 500 hectares of plantations and pasture. The water is also used as discharge to wetlands.<sup>178</sup> Albury also has plans for using the treated water for domestic purposes, including lawn watering and toilet flushing. Albury expects up to 350 new houses to be completed and using treated water by 2008.<sup>179</sup>
- 4.44** On a larger scale (with substantially more funding) the Sydney Olympic Park Authority has developed a significant urban water reuse scheme to 'provide recycled water to residential, commercial and sporting facilities at Sydney Olympic Park and Newington.'<sup>180</sup>

<sup>174</sup> Dr Merrick, Evidence, 20 March 2006, p55

<sup>175</sup> Dr Merrick, Evidence, 20 March 2006, pp55-56

<sup>176</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p38

<sup>177</sup> Submission 22, Dr Khan, p10

<sup>178</sup> Email from Mr Daryl McGregor, Engineer, Albury City Council, to Principle Council Officer, 10 April 2006

<sup>179</sup> Email from Mr Daryl McGregor, Engineer, Albury City Council, to Principle Council Officer, 10 April 2006

<sup>180</sup> Andrzej Listowski, 'Recycled Water System for Future Urban Developments,' 2005, tendered by Mr Listowski, during the site visit of 22 March 2006

- 4.45** The scheme is known as the Water Reclamation and Management Scheme and incorporates the collection and treatment of stormwater and sewerage; supply of non-potable recycled water to residents, commercial premises and sporting venues; and the supply of recycled water for the irrigation of parklands and playing fields.<sup>181</sup>
- 4.46** This water management scheme saves approximately 850 megalitres of potable water per annum and reduces the amount of potable water consumed at Sydney Olympic Park and Newington by approximately 50%. The Water Reclamation and Management Scheme also uses nearly 100% of the sewage produced at Sydney Olympic Park and Newington<sup>182</sup>
- 4.47** Mr Sam Haddad, Director General of the Department of Planning (DoP) and Ms Lisa Corbyn, Director General of the Department of Environment and Conservation, both emphasised the positive outcomes from the Sydney Olympic Park scheme. Ms Corbyn noted:

The Olympic site in particular was a real positive charge to people in understanding how you can get that integrated solution ... That ... has given us a completely different picture of what can be achieved and it gives a real positive step forward. You can go to developers and others and say, "This is not pie in the sky. This is something that can be done on the ground." That is why I think the momentum really has built for some of those integrated programs.<sup>183</sup>

### ***Industrial use***

- 4.48** The Committee was presented with evidence during the inquiry that the reuse of recycled water by industry was a good alternative to recycling water for potable purposes. Industry consumes only 12% of potable water in the Sydney region. Nonetheless, many industrial facilities can use recycled water, saving sizeable volumes of potable water.
- 4.49** Witnesses claimed that recycled water to be used in industrial processes does not have to be treated to as high a level as water intended for drinking and is much less costly to provide. As Dr Khan noted in his submission, a good example of industrial reuse in New South Wales is the provision of treated wastewater to Bluescope Steel in Wollongong from the Wollongong Sewerage Treatment Plant for use in the steel manufacturing plant.<sup>184</sup>
- 4.50** Bluescope Steel currently uses approximately 32 megalitres of water a day at its Port Kembla steelworks. Bluescope now uses approximately 20 megalitres a day of recycled water from the Wollongong sewerage treatment plant.<sup>185</sup> This amount of treated water is significant, both for the steelworks and for the ocean outfall. Bluescope Steel's use of the wastewater has the potential to reduce the volume of wastewater discharged to the ocean by 40%.<sup>186</sup>

<sup>181</sup> Sydney Olympic Park Authority, 'Urban water reuse and integrated management,' *Brochure*, March 2004

<sup>182</sup> Sydney Olympic Park Authority, 'Urban water reuse and integrated management,' *Brochure*, March 2004

<sup>183</sup> Ms Corbyn, Evidence, 23 March 2006, p37

<sup>184</sup> Submission 22, Dr Khan, p10

<sup>185</sup> <[www.wme.com.au/magazine/downloads/industrialwaterguide\\_2005.pdf](http://www.wme.com.au/magazine/downloads/industrialwaterguide_2005.pdf)> (accessed 1 May 2006)

<sup>186</sup> <[www.wme.com.au/magazine/downloads/industrialwaterguide\\_2005.pdf](http://www.wme.com.au/magazine/downloads/industrialwaterguide_2005.pdf)> (accessed 1 May 2006)

**4.51** The steelworks are ideally located for such a project, being only 3 kilometres from the sewerage treatment plant. It was this factor, more so than other considerations that allowed the project to ‘get off the ground’.<sup>187</sup>

**4.52** Mr Klass Boes, a representative of the Kurnell Progress and Precinct Association Incorporated, told the Committee that Caltex, operating an oil refinery at Kurnell, has been considering sewer mining, or taking treated water from the Cronulla Sewerage Treatment plant to use for its industrial purposes:

As far as I am aware, and I will stand corrected here, I believe there is something like 240,000 litres of water [per day] being used at the Caltex Oil Refinery.

...

Caltex management told us that yes, it is a very good idea, but there is a costing involved and there is the negotiation with Sydney Water. Caltex had a meeting last December and I put it again to them and the answer I had was that they were negotiating with Continental Carbon, which is now Koppers, and Sydney Water in trying to get an agreement whereby they would be able to use the water that goes into the ocean at present at Potter Point and start making use of that in the process in the Kurnell refinery.<sup>188</sup>

**4.53** The Government has identified a number of future projects involving the recycling of treated wastewater and stormwater for industrial use. One of these projects is the Camellia Recycled Water Project, to be located in the Camellia area near Parramatta.<sup>189</sup>

**4.54** This is an area with many large factories and it is proposed to service them with recycled water for industrial and open space use. This project will entail the design and construction of a recycled water treatment facility, pipelines, service reservoirs, pumping stations and other ancillary works. Treated wastewater is available from Liverpool Sewage Treatment Plant, for retrieval through sewer mining or provided from an expanded Water Reclamation and Management Scheme located at Sydney Olympic Park, Homebush Bay. It may then be delivered to commercial and industrial customers. It is estimated that this project could recycle up to 6 gegalitres each year.

**4.55** Several companies have been short-listed for this project. These include:

- Australian Gas and Light Company (AGL) joined by Agility Management and Veolia Water Australia
- Earth Tech Engineering joined by McConnell Dowell
- United Utilities and Transfield Joint Venture joined by Tenix Alliance and Sinclair Knight Merz.

**4.56** Some companies have expanded on the original proposal. The evidence before the Committee from AGL is that it intends to utilise existing isolated gas mains and add a recycled water

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<sup>187</sup> <[www.wme.com.au/magazine/downloads/industrialwaterguide\\_2005.pdf](http://www.wme.com.au/magazine/downloads/industrialwaterguide_2005.pdf)> (accessed 1 May 2006)

<sup>188</sup> Mr Boes, Evidence, 23 March 2006, p44

<sup>189</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p43

pipeline to a major gas construction across Sydney. AGL are of the view that the use of existing gas pipeline infrastructure will significantly reduce the establishment costs of an effective recycled water-reticulation network. AGL anticipates that the project could be completed within five years. AGL expects that this project will make a major contribution to the development of a sustainable water supply system for Sydney.

- 4.57** Mr Bob Wilson, a member of the Hawkesbury-Nepean Catchment Authority Board, advocated the need for private industry to be brought into recycling initiatives, in order to both encourage this sector's use of wastewater and to demonstrate to the public that treated wastewater could be used in a safe manner:

I did some work for a former Minister and showed where industry can be quite willing, with a few incentives, such as trying to simplify the plethora of regulations that hit them all at one time, to show them that they can recycle. So you get examples, you get the farmers in the Hawkesbury-Nepean on side and show them, in a very positive way, how to improve pasture and improve production. You get the nursery people and all those sorts of people and start off in a small way. You do not hit them overnight with, "Do you want to drink water out of the toilet?" That seems to have been the question that somebody has been asking people. You have to do it in a gradual way.<sup>190</sup>

***Dual reticulation systems for household reuse***

- 4.58** A dual reticulation system involves two sets of pipelines for each dwelling. One pipe system provides drinking water to the dwelling and disposes of wastewater, the other completely separate pipeline system, provides treated wastewater for use in toilet flushing and watering the garden. The biggest dual reticulation development in Australia is at Rouse Hill, in Western Sydney, as examined in the following case study.<sup>191</sup>

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<sup>190</sup> Mr Wilson, Evidence, 20 March 2006, p42

<sup>191</sup> Submission 22, Dr Khan, p11

***Rouse Hill Recycled Water Plant (RWP)***<sup>192</sup>

Rouse Hill RWP makes up part of the NSW Government's overall Water Conservation and Recycling Plan. This plant, in Sydney's northwest, is Australia's largest residential recycled water scheme.

Recycled water is created where wastewater (sewage) is piped to a sewage treatment plant, extensively treated and then pumped to farms, parks, golf courses, businesses and homes for reuse. Wastewater from Rouse Hill RWP is returned to homes for reuse in toilet flushing, on gardens and other outdoor uses.

The scheme started in 2001 and presently serves around 40,000 people, treating 10.5 megalitres per day. The plant is currently capable of serving 50,000 people but further expansion is planned to prepare for around 250,000 people as the population increases.

Homes in the area are fitted with a dual reticulation system. Put simply, these homes are fitted with two sets of pipes, supplying two, completely separate streams of water, for different purposes. The first is the drinking water system supplied from the catchment area as is the rest of Sydney. The second supply is distributed in a second set of pipes containing recycled water. To avoid confusion these pipes carrying recycled water are coloured purple (lilac). Taps have removable handles to prevent anyone from accidentally drinking the recycled water.

The sewage catchment area for Rouse Hill RWP is almost entirely domestic, thereby reducing the risk of contamination by dangerous chemicals. There is an ongoing education system to ensure that people in the area don't inadvertently contaminate their own water supply.

Wastewater in Rouse Hill passes through a number of treatment phases allowing it to be recycled for reuse. Once at the treatment plant the water is subjected to an array of physical, biological and chemical processes to prepare it for safe reuse in toilets and on gardens.

The Rouse Hill Recycled Water Area is part of a water management program designed to help protect the Hawkesbury-Nepean River. This includes the recycling of treated wastewater and also pollution reduction in the stormwater system. Wastewater that is not recycled is released into man-made wetlands in Seconds Ponds Creek where it is subject to the natural cleansing processes of the wetland environment. The advanced treatment of this water ensures that the impact on water quality is minimised.

- 4.59** In the 2006 Metropolitan Water Plan, the Government announced its commitment to providing recycled water via dual reticulation systems for all new homes to be built in new suburbs in Sydney's North West and South West growth centres over the next 25 years. The Government has incorporated a provision in the draft State Environmental Planning Policy (Sydney Region Growth Centres) 2006 that requires developers to connect to a recycled water system, if one is available.<sup>193</sup>

<sup>192</sup> Sydney Water website <[www.sydneywater.com.au](http://www.sydneywater.com.au)> (accessed April 2006)

<sup>193</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p36

## Harvesting stormwater

**4.60** As noted in the introductory chapter, the Bureau of Meteorology records a relatively abundant level of rain falling on the city of Sydney. This rain or stormwater is collected in drains through which it flows out to sea with the principal intention of protecting urban areas from flooding. Increasingly, however, stormwater is being considered a resource that, if sufficiently collected, can provide a substantial supplement to Sydney's non-potable water supply. As the Minister for Local Government, the Hon Kerry Hickey MP, noted in his second reading speech to the Local Government Amendment (Stormwater) Bill, 'The Government recognises that stormwater now needs to be managed in an integrated manner, to deal with stormwater harvesting and flooding in a broader natural resources management context.'<sup>194</sup>

**4.61** The responsibility for the provision of urban stormwater management services is predominantly at local government level.<sup>195</sup> The recent *Local Government Amendment (Stormwater) Act 2005* allows councils to charge a nominal fee to their constituents for the provision of stormwater management services.<sup>196</sup>

**4.62** As stormwater runs through the streets and building sites of urban areas, it quickly picks up contaminants that may pose a serious environmental problem once concentrated in large amounts and diverted to rivers or oceans. Ms Corbyn, of the Department of Environment and Conservation, explained that the Stormwater Trust Program developed by the Government was designed to assist councils to improve the capture of stormwater in their areas, as well as improving the quality of the stormwater being captured.<sup>197</sup> From 2003, the program allocated \$51 million to councils to fund 252 stormwater management projects.<sup>198</sup>

**4.63** Mr Ian Drinnan, Principal Environmental Scientist from Sutherland Shire Council, explained that as local councils are a significant water user, they are keen to develop water conservation mechanisms, particularly those related to the improved collection of stormwater for the irrigation of public amenities such as golf courses and playing fields:

We are looking at stormwater harvesting for those water uses that do not require high-quality water, do not require potable water, in conjunction with a range of other practices such as recycled water usage and change of water practices.<sup>199</sup>

**4.64** Ms Corbyn also noted that the issue of storage of stormwater and the necessary infrastructure requirements is a challenging one:

It is quite challenging to get a good system of stormwater harvesting in place in part because you need a larger storage capacity ...

<sup>194</sup> Hon Kerry Hickey MP, Minister for Local Government, Legislative Assembly, New South Wales, 13 September 2005, p17644

<sup>195</sup> <[www.deh.gov.au/coasts/publications/stormwater/pubs/stormwater.pdf](http://www.deh.gov.au/coasts/publications/stormwater/pubs/stormwater.pdf)> (accessed April 2006)

<sup>196</sup> *Local Government Amendment (Stormwater) Act 2005*, <[www.parliament.nsw.gov.au](http://www.parliament.nsw.gov.au)> (accessed April 2006)

<sup>197</sup> Ms Corbyn, Evidence, 23 March 2006, p36

<sup>198</sup> <[www.environment.nsw.gov.au/stormwater/usp/grants](http://www.environment.nsw.gov.au/stormwater/usp/grants)> (accessed April 2006)

<sup>199</sup> Mr Drinnan, Evidence, 10 March 2006, p53

The Stormwater Trust gave us much more than practical experience about how you might progress, particularly with local councils getting stormwater harvesting programs that work and are practical up and running, and overcome some of those challenges about the infrastructure that has to go around it.<sup>200</sup>

- 4.65** However, a number of witnesses told the Committee that the stormwater that is not being collected currently represents a substantial loss to Sydney's water resources. They argued that if this water could be collected more effectively, Sydney would have a significant supplement to its current water supply.
- 4.66** The Committee heard that stormwater might be more effectively collected through the use of porous surface materials to collect stormwater beneath the surfaces of car parks and other urban surface areas. For example, Manly Council has paved the car park at the beach with porous paving that reduces stormwater flow and provides a level of filtration for the stormwater. The stormwater passes through the pavers, through bio-soil (a special filtration material) and is then used to irrigate the Norfolk Pines along the beachfront.<sup>201</sup>
- 4.67** Mr Ian Kiernan, Executive Chairman of Clean Up Australia Ltd also noted the potential to collect water in old industrial sites, for example the cooling tanks underneath the power station at Pyrmont. He explained that although the tanks originally used saltwater for cooling, they could be sealed off and used as a 'massive storage dam'.<sup>202</sup>
- 4.68** Similarly, Professor Essery argued that, on a broad level, the urban environment of the city had the capacity to store stormwater much more effectively than it currently does:

Our cities are perfect collectors of water, whereas our catchments are imperfect collectors. If you came from another planet you would wonder why we are collecting our water from the catchments and not from surfaced areas that we have created. Equally, when most people think about stormwater, they think about floods and drainage issues. Well, if you harvest that water and put in appropriate retention tanks – not massive tanks, but appropriate retention tanks – across the whole of the city, under parks, under playing fields, under cricket grounds, under larger buildings, you rid yourself of the flooding problem as well.<sup>203</sup>

- 4.69** In turn, Councillor Sam Byrne, Mayor of Marrickville Council and Executive Member of the Local Government and Shires Association of New South Wales, noted the existence in Marrickville of a substantial reservoir just north-west of Sydenham station. Councillor Byrne suggested that this reservoir could be used to store recycled water for the parks and gardens in the local area.<sup>204</sup>
- 4.70** However, Mr Evans, Managing Director of Sydney Water, advised the Committee that, from Sydney Water's perspective, stormwater harvesting presented a significant challenge from a cost-benefit perspective. Mr Evans noted that the collection of stormwater in a built-up city

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<sup>200</sup> Ms Corbyn, Evidence, 23 March 2006, p36

<sup>201</sup> <[www.deh.gov.au/coasts/publications/stormwater/pubs/stormwater.pdf](http://www.deh.gov.au/coasts/publications/stormwater/pubs/stormwater.pdf)> (accessed April 2006)

<sup>202</sup> Mr Kiernan, Evidence, 10 March 2006, p5

<sup>203</sup> Professor Essery, Evidence, 10 March 2006, p15

<sup>204</sup> Clr Byrne, Evidence, 10 March 2006, p24

like Sydney would present significant costs in terms of harvesting, storing and treating the water, particularly when compared with other options:

... the difficulty is harvesting, storing, treating and supplying that water in a city that is very highly developed, where land is expensive and so on. What tends to happen around the world is that in built-up cities it is very difficult to retrofit stormwater collection facilities. We can develop stormwater harvesting capacity by integrating it into flood control measures in new suburbs and then use the stormwater for social amenity and/or irrigating playing fields and so on.<sup>205</sup>

### Rainwater tanks

**4.71** It is possible to collect stormwater in a number of ways, not only at the broader urban infrastructure level. Stormwater run off can also be collected in household rainwater tanks, an option that is currently subsidised by the Government. Mr Evans advised the Committee that 20,000 rainwater tanks had been installed under the Government's rebate program.<sup>206</sup> The May 2006 Metropolitan Water Plan states the Government intends to subsidise rainwater tank installation until June 2008.<sup>207</sup>

**4.72** However, Mr Martin from the Total Environment Centre believed that more could be done to encourage householders to install rainwater tanks and that reducing the need for council approval was not a sufficient incentive in itself:

Whilst there are some rainwater tanks being installed by households throughout Sydney, the uptake probably is not as good as we would have hoped and there could be an issue of incentives that needs to be addressed.<sup>208</sup>

**4.73** While many inquiry participants supported the installation of rainwater tanks, a number of witnesses told the Committee that installation and maintenance need to be monitored to ensure the proper use of the tanks. Professor Essery emphasised to the Committee the need to ensure that people are not compromising the health and safety of their areas. He argued that de-regulating to allow people to install tanks without approval was actually a potentially hazardous measure:

If we got to the point where there is no regulation – and the current regulations are quite dangerous in my opinion – if we do not have a proper regulatory environment we will end up having, in 20 years time, a whole series of hodgepodge connections left right and centre. That is why we have to integrate this thing and we have to make a community decision, into our way of doing business.<sup>209</sup>

**4.74** Professor Ashbolt also emphasised the need for monitoring of rainwater systems, whether through inspection by council or a private contractor:

<sup>205</sup> Mr Evans, Evidence, 23 March 2006, p14

<sup>206</sup> Mr Evans, Evidence, 23 March 2006, p14

<sup>207</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p37

<sup>208</sup> Mr Martin, Evidence, 10 March 2006, p46

<sup>209</sup> Professor Essery, Evidence, 10 March 2006, p20

The critical link is that there needs to be an outside professional organisation maintaining these sorts of on-site systems ... That is one of the reasons why we have a large centralised water service and wastewater provision, because of that inherent problem with individuals not being able to look after their own backyards, if you like. We need Sydney Water to be charged with the brief to also maintain and manage such on-site systems, or government incentives that will allow other organisations to come in and provide that.<sup>210</sup>

- 4.75** In answers to questions taken on notice, Sydney Water advised that the 'rainwater tank rebate values are based on their likely impact on customer behaviour and the estimated consequent reduction in water use'.<sup>211</sup> Sydney Water told the Committee that this program is 'designed to encourage customers connected to a Sydney Water supply, who would not otherwise have done so, to purchase a rainwater tank'.<sup>212</sup> Sydney Water added that it was reluctant to consider large-scale, subsidised maintenance services, primarily because it would not be a cost effective measure.

## Groundwater

- 4.76** As outlined in the 2004 Metropolitan Water Plan, the term groundwater refers to all water occurring underground, in water bearing zones called aquifers in which water has accumulated in the spaces between the sediments or cracks in the bedrock. There are four major types of aquifers, including coastal sands, porous, alluvial and fractured rock.<sup>213</sup> The February 2006 Progress Report advises that the Sydney Catchment Authority (SCA) has conducted a study to determine potential groundwater sites around the Sydney catchment. While the SCA expects to complete this study June 2006, it has identified a major groundwater reserve in the Upper Nepean, which is estimated as capable of producing up to 15 gigalitres per year for three years at a time. Additionally, the study has revealed positive indications of a substantial groundwater resource at Leonay in Western Sydney.<sup>214</sup>
- 4.77** On completion of the study, the SCA intends to publish a detailed report on its findings relating to the groundwater resources and their long-term maintenance. The Progress Report indicates this report will be available for community comment, although the Report also notes that the Government intends to fast-track the design and environmental assessment process related to the groundwater projects, to support current water supplies 'if the current drought worsens, or for the next major drought'.<sup>215</sup>
- 4.78** In his evidence to the Committee, Dr Merrick described the current sources of groundwater in New South Wales, including the new bores indicating supplies of groundwater. He noted

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<sup>210</sup> Professor Ashbolt, Evidence, 20 March 2006, p33

<sup>211</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr David Evans, Managing Director, Sydney Water, Question 13, p16

<sup>212</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 13, p16

<sup>213</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p11

<sup>214</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p12

<sup>215</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p12

that the only source of groundwater located close to the central business district is at Botany Sands, which has a resource of 12,000 megalitres a year. Dr Merrick also described aquifers at Mangrove Mountain, the Southern Highlands and possibly Leonay. Although the Leonay aquifer was yet to be proven with only two bores drilled, Dr Merrick advised it looked promising.<sup>216</sup>

**4.79** Dr Merrick outlined the long-term potential of these aquifers, advising that the withdrawal of too much groundwater can affect creek flow and the ecosystems that rely on them. Dr Merrick advised the Committee that the recharge of water to the Mangrove Mountain aquifer is approximately 200,000 megalitres per annum and that the Government's position 'at the moment is to allow extraction of 8,000 megalitres each year, whilst still preserving creek flow'.<sup>217</sup>

**4.80** Mr Graeme Head, Managing Director of the SCA, advised the Committee that the newly proposed groundwater sites were only intended as drought relief resources – to be used when dam storage was low and for relatively small, finite periods of time:

The southern highlands resource has been identified as being able to provide about 15 gigalitres of water per year for a period of about three years during times of serious drought. The proposal is only to access ground water during periods of serious drought, thus allowing significant periods of time for recharge of ground water resources. We have two additional sites, one of which is quite close to Warragamba Dam and one quite close to the Illawarra escarpment near Lake Avon where the drilling works will be commencing over the coming weeks. The quantum of available resources in each of the seven priority areas will be identified in the first report on the studies which is due to be completed in June this year.<sup>218</sup>

**4.81** Mr Peter Prineas, Member of the Executive of the Nature Conservation Council of New South Wales, advised the Committee that in the opinion of the Council, regulation of groundwater use 'may also need to be reviewed in the current policy climate to make sure there is in fact effective control over extraction'.<sup>219</sup>

**4.82** Dr Merrick outlined a number of possible groundwater sources that may not yet have been considered by the Government, including groundwater in Botany Sands,<sup>220</sup> however he did note that groundwater resources are not sufficient to replace Sydney's drinking water supply:

Ground water on its own will only get you through for a week ... Ground water is not a substitute. It allows you to work at the margins. It is a marginal resource. It is ideal as a drought back up but it is not a serious substitute in Sydney. Cities like Perth get 60 per cent ground water but we do not have those resources.<sup>221</sup>

<sup>216</sup> Dr Merrick, Evidence, 20 March 2006, pp53-54

<sup>217</sup> Dr Merrick, Evidence, 20 March 2006, p58

<sup>218</sup> Mr Head, Evidence, 23 March 2006, p4

<sup>219</sup> Mr Prineas, Evidence, 20 March 2006, p19

<sup>220</sup> Dr Merrick, Evidence, 20 March 2006, pp53-54

<sup>221</sup> Dr Merrick, Evidence, 20 March 2006, pp59-60

## Dam extensions

- 4.83** In the 2004 Metropolitan Water Plan, the Government indicated that it would modify Avon, Warragamba and potentially Nepean Dams. The SCA is currently constructing access points at the bottom of the dams to increase Sydney's water supply by an additional six months in the immediate drought, as well as providing additional storage for future supply.<sup>222</sup>
- 4.84** The February 2006 Progress Report estimates this project will be completed by August 2006 at Warragamba and Nepean Dams. Construction at these dams will cost \$120 million, providing Sydney with an additional 40 gigalitres of water per year, or an increase in dam capacity of 8%.<sup>223</sup>
- 4.85** In evidence, Mr Head explained both projects are close to completion:
- Those projects are very well advanced and will be completed in August of this year. The most significant engineering milestone of the Warragamba project, which is where the bulk of the water is occurring, will be completed in about four weeks time.<sup>224</sup>
- 4.86** While the project to increase the capacity of Warragamba and Nepean Dams will provide Sydney with an addition to its water supply, the Committee notes this increases Sydney's current water supply by only 6 months in the current drought. The Committee highlights the need for additional, long-term sustainable measures to secure for Sydney's water supply both in times of drought and against the long-term growth of Sydney's population.

## Leakage

- 4.87** The 2006 Metropolitan Water Plan indicates that:
- Sydney has nearly 21,000 kilometres of pipes which carry water to households, businesses and government across Sydney, the Illawarra and the Blue Mountains.
  - Around 18,000 kilometres of mains are being inspected for hidden leaks each year.
  - Over the next four years, over \$400 million will be invested in these activities, including nearly \$100 million in 2005-2006.
  - It is estimated that nearly 17 gigalitres of water per year is presently saved, with an estimate of around 33.5 gigalitres per year by 2015.<sup>225</sup>
- 4.88** In evidence, Mr Evans highlighted Sydney Water's commitment to the inspection of water mains and the detection of leaks. He advised the Committee that leakage has been reduced by 25% in the 'past few years' and that the aim was to reduce leakage by a further 25% in the

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<sup>222</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p8

<sup>223</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p11

<sup>224</sup> Mr Head, Evidence, 23 March 2006, p4

<sup>225</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p57

near future.<sup>226</sup> Mr Evans also noted that Sydney Water's future targets of leak detection and prevention are 'will be very good by international and Australian standards.'<sup>227</sup>

**4.89** In Sydney Water's Water Conservation and Recycling Implementation Report 2004/2005, the Active Leakage Reduction Program is described as '... a key component of the strategy to meet Operating License water conservation targets ...'.<sup>228</sup> The Report lists five activities to reduce leakage namely leakage detection and repair, speed and quality of leak repairs, pressure management, flow metering, and asset management (watermain renewals).

**4.90** The Report in turn noted that only 10% of supply was being lost through leakage.<sup>229</sup>

**4.91** In their submission, the CSIRO advised that Sydney Water's performance against the International Leakage Index (ILI) was good, scoring a nominal figure of 1.8. A score of below 3 would indicate 'a reasonably good level of loss control performance'.<sup>230</sup>

**4.92** Mr Ross Young, Executive Director of the Water Services Association of Australia, also emphasised that, in comparison to other water authorities, Sydney Water's record for addressing leakages was good and that Australia as a whole was far ahead of North America and Europe in terms of leakage prevention:

... even the worst of the performers in the Australian urban water industry are better than the North Americans, the Europeans and certainly the South Africans. That is because at the time of drought the Australian urban water industry realised that if it wanted to encourage the community to be more frugal and efficient with their use of water, they really had to get their own house in order. So an enormous amount of money has been invested into finding where the leaks are and using new technology to enable those leaks to be fixed in a cost-effective way.<sup>231</sup>

**4.93** However, Professor Essery told the Committee that he did not believe independent research had been conducted to establish 'what the leakage figures for Sydney are.'<sup>232</sup> He argued that figures for leakage show dramatic reductions because of an intermittent process of measurement:

There has been no independent review to establish what the leakage figures for Sydney are, but about three or four years ago it went from 17 or 18 per cent to 11 per cent overnight. Why? Because they actually calibrated the meters for the first time in 20 years. So the information we have been getting is not reliable.<sup>233</sup>

<sup>226</sup> Mr Evans, Evidence, 23 March 2006, p6

<sup>227</sup> Mr Evans, Evidence, 23 March 2006, p6

<sup>228</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, pp36-37

<sup>229</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, p37

<sup>230</sup> Submission 46, CSIRO, p16

<sup>231</sup> Mr Young, Evidence, 20 March 2006, p48

<sup>232</sup> Professor Essery, 10 March 2006, p13

<sup>233</sup> Professor Essery, 10 March 2006, p13

- 4.94 Professor Essery then suggested that the cost of updating the current infrastructure to prevent leakage was so significant that other measures of water saving should be considered. He told the Committee:

What we have to do is go back and think how much it will cost to replace our existing 100-year-old infrastructure. When doing that, take into account that you might put in a dual reticulation system and be working with the private sector and/or working with the public sector.<sup>234</sup>

### Increased transfers from Shoalhaven River

- 4.95 Another proposal put forward in the 2004 Metropolitan Water Plan was to increase water currently pumped from Tallowa Dam on the Shoalhaven River to the Sydney dams, by diverting the water that runs over Tallowa Dam when the Shoalhaven River experiences high flows.<sup>235</sup>
- 4.96 In evidence, a number of participants, including the Shoalhaven River Alliance, the Combined Community Groups of Sutherland Shire Concerned with Water-saving in Greater Sydney and the Kurnell Progress and Precinct Association raised concerns related to this proposal. This issue is addressed further in Chapter 7.
- 4.97 The 2006 Metropolitan Water Plan notes that, in light of the analysis showing that this additional water is not needed for at least the next 10 years and in acknowledgment of the strong preferences of the Shoalhaven community, the Government has decided not to raise the Tallowa Dam wall. The Plan noted that the Government is examining options for a modest increase in water transfers from the Shoalhaven without raising Tallowa Dam wall. A discussion paper will be released for community comment in mid-2006.<sup>236</sup>

### Private sector involvement

- 4.98 There are a number of ways in which the private sector may be involved in creating a more sustainable environment for the use of water in Sydney. These include the use of treated recycled water by industry, the provision of water treatment and recycled water services and the provision of water saving devices. The Committee notes that the Independent Pricing and Regulatory Tribunal (IPART) final report of the *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region*, focused on the introduction of a more competitive marketplace for the water provision industry and recommended a progressive opening up of the industry to involvement with the private sector.<sup>237</sup> The IPART report continued:

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<sup>234</sup> Professor Essery, 10 March 2006, p13

<sup>235</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p9

<sup>236</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p85

<sup>237</sup> Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region: Final Report*, October 2005, p3

This will create a more dynamic market in which private sector participants compete to identify opportunities to provide innovative water and wastewater services that meet customers' needs within an environment of increased water scarcity.<sup>238</sup>

- 4.99** The Committee received information on a number of cases where the private sector is involved in water management, including the success of the Bluescope Steel water reuse project at Wollongong. Mr Evans also told the Committee of a potential site for water reuse at Camellia:

For example, there is an industrial cluster around Camellia centered around Shell and others, and the idea of servicing that under the Camellia expression of interest is to allow people to extract sewer effluent or influent on site, treat it and provide it direct to industry, not bring it all the way back from the coast.<sup>239</sup>

- 4.100** The Committee also heard of proposals from the private sector concerning the treatment and sale of wastewater to the community from Mr John van der Merwe, CEO of Services Sydney.

***Services Sydney large scale water reclamation project***<sup>240</sup>

- 4.101** Mr van der Merwe advised the Committee that he believed his organisation could offer Sydney Water high level water treatment facilities, as well as supply water for non potable reuse to Sydney and the Hawkesbury-Nepean and Shoalhaven catchments:

It is important that the Parliament is aware of the immense potential of large-scale water reclamation. It provides significant economic dividends to the community and enormous sustainability dividends to the environment. Firstly, there will be the benefits of drastically cutting the amount of barely treated sewage that is pumped into the ocean every day from the outfalls at Malabar, Bondi and North Head.<sup>241</sup>

- 4.102** Sydney Water currently disposes of 450 gigalitres of sewage and wastewater per year through the deep ocean outfalls at Malabar, Bondi and North Head. Services Sydney wants to build water reclamation facilities that harvest this water.

- 4.103** Services Sydney proposes to construct a new water reclamation, treatment and storage facility as an alternative for the treatment and disposal of Sydney's sewage and wastewater. This facility would link new pipes to the Sydney sewage reticulation network at the points where the main trunk sewers connect each of the North Head, Bondi and Malabar sewage treatment plants. Water conduits would then return tertiary treated water to the base of Sydney's catchment dams to replace water otherwise needed for environmental flows. It is proposed that this facility would:

- cut the amount of poorly treated sewage put into the ocean

<sup>238</sup> Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region: Final Report*, October 2005, p3

<sup>239</sup> Mr Evans, Evidence, 23 March 2006, pp18-19

<sup>240</sup> Information taken from evidence given by Mr Van der Merwe at hearing 10 March 2006, pp31-39

<sup>241</sup> Mr van der Merwe, Evidence, 10 March 2006, p31

- save limited potable water from SCA storages earmarked for environmental flows in the Hawkesbury, Nepean and Shoalhaven Rivers by using the recycled water for environmental flows
- create jobs in the construction industry and many more in the future as this water becomes available for agriculture, irrigation and industry
- create no extra expense for taxpayers/government.<sup>242</sup>

**4.104** Services Sydney proposes to connect the three major outfall systems with a deep tunnel system and further deep tunnels to take the water back. Services Sydney would take on all aspects of sewage management and pay Sydney Water for the transportation portion of the operation. Services Sydney requires the use of existing in-ground pipes, sewers, manholes and pumping stations to make the project viable. It is suggested that the public infrastructure would be used in the same way as Optus uses Telstra lines and that Services Sydney would pay an access fee for using the Sydney Water infrastructure. In turn, Services Sydney would charge the government for any water that was transferred back to the Hawkesbury-Nepean using Services Sydney infrastructure.

**4.105** As an additional component to this proposal is the ability to make use of the nutrient rich biosolids as a valuable resource for agriculture. At this stage, Services Sydney does not propose to produce potable water.

**4.106** According to Services Sydney, the use of water from ocean outfalls is seen as a long-term solution as it provides a large water resource that is currently wasted and adding to environmental degradation. Services Sydney does not see local waste recycling schemes as a viable alternative for the established parts of Sydney in the long-term as they will not be productive enough to meet demand.

**4.107** In response to this proposal, Mr Evans of Sydney Water explained that while a number of private sector agencies are engaged in larger scale water management infrastructure projects, in relation to the Services Sydney proposal to sewer mine and provide treated wastewater back to the community, Sydney Water felt that a possible negative social impact, in terms of outfall effluent may make this proposal undesirable:

... there is no difficulty at all with the involvement of the private sector. The most material issue in this debate about the use of the outfall effluent is the social value of undertaking such an exercise rather than who might do it. It is a question of social economics as to whether the community can justify the effort and cost of retrieving that effluent and applying it to a use. In an engineering sense, it can be done, but the high social costs must be considered ... There is no philosophical problem with using effluent from the ocean outfalls; it is purely a question of social cost effectiveness, and the costs are substantial.<sup>243</sup>

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<sup>242</sup> Mr van der Merwe, Evidence, 10 March 2006, p31

<sup>243</sup> Mr Evans, Evidence, 23 March 2006, p13

## Committee comment

**4.108** The Committee heard evidence that a great deal of potable water was not captured effectively under the current water management systems. For example, Professor Essery told the Committee that, in his view, over 400 gigalitres per annum of potential water for recycling is discharged through ocean outfalls, that a possible 200 gigalitres per year of rainwater is not collected, that 500 gigalitres per year of stormwater is discharged into the ocean, and finally, that 230 gigalitres per year of groundwater has not been harnessed as a resource.<sup>244</sup> This evidence would indicate that there is a total of 1,330 gigalitres of water available to Sydney each year.

### *Potable water reuse*

**4.109** The Committee believes that the reuse of potable water has the potential to greatly contribute to a sustainable water supply for Sydney, however, the Committee notes that the infrastructure required to pump treated water back to Warragamba from treatment plants is significant. The cost to establish the necessary piping and the energy required to pump the water through the pipes to Warragamba Dam, may make this option less desirable.

**4.110** Based on evidence to this inquiry, the Committee suggests that the idea of introducing treated wastewater into a potable supply may not be as adverse to the wider community as generally believed. However, this option was certainly not advocated as consistently as the need for reusing treated wastewater for non-potable activities.

### *Non-potable water reuse*

**4.111** The Committee strongly supports Sydney Water's engagement with industry to use treated water for industrial purposes. While the Committee notes the complexity of developing such an arrangement, the Committee also notes the significant benefit to the community of a reduction in the use of potable water for industrial purposes. The Committee encourages Sydney Water's further negotiation and development of these kinds of contracts.

**4.112** The Committee toured Sydney Olympic Park and was able to view first hand the different components of the water reclamation and management scheme. The Committee was impressed both by the substantial savings of potable water made by Sydney Olympic Park Authority as well as the environmentally sustainable management of the water resources at Sydney Olympic Park. The Committee strongly supports such developments and acknowledges the positive, advanced work of Sydney Olympic Park Authority in this regard.

**4.113** The Committee also visited the Rouse Hill Sewerage Treatment Plant to gain an understanding of how the sewerage treatment and treated water supply system worked. The Committee believes this development has been a successful part of the Government's water management strategy. The Committee recommends that Sydney Water consider utilising further housing developments to replicate the success of the water recycling project at Rouse Hill.

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<sup>244</sup> Submission 133, Professor Essery, Attachment 1

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**Recommendation 6**

That Sydney Water consider utilising further housing developments to replicate the success of the water recycling project at Rouse Hill.

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***Stormwater harvesting***

- 4.114** The Committee encourages both Sydney Water and local government to continue to expand and improve their stormwater management initiatives. The Committee is concerned that a significant amount of stormwater is simply diverted to oceans and rivers where, at best it is a wasted resource and at worst, may be contributing to significant environmental damage of Sydney's oceans and rivers. The Committee notes the challenges of collecting stormwater in an urban environment, but highlights the potential benefits if stormwater is successfully diverted toward non-potable uses.
- 4.115** The Committee also supports Sydney Water's efforts to encourage households to install rainwater tanks, however the Committee is concerned that removing the requirement for local government approval of the installation potentially compromises the success of such water saving measures. The Committee recommends that a different structure of incentives should be considered for households that choose rainwater tank options, including subsidised professional instalment and maintenance costs.
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**Recommendation 7**

That Sydney Water consider a different structure of incentives for households that choose to install a rainwater tank, including subsidised professional instalment and maintenance costs.

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***Groundwater harvesting***

- 4.116** The Committee notes that groundwater is a viable source of potable water to augment supply to the population of Sydney. However, the Committee highlights the need to extract groundwater cautiously, ensuring that extraction remains within the limits of an aquifer's supply to other water sources, including creeks and rivers. The Committee also emphasises that the groundwater available to metropolitan Sydney should be viewed as a small part of an overall, integrated water management strategy.

***Leakage prevention***

- 4.117** The Committee notes that Sydney Water, contrary to some public opinion, has a relatively successful record in preventing leaks from the infrastructure that supplies metropolitan Sydney with water and sewerage treatment services. The Committee recommends that Sydney Water continue to develop its Active Leakage Reduction program and consider publishing estimates of both the number of leaks in the system and their subsequent reduction.

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**Recommendation 8**

That Sydney Water continue to develop its Active Leakage Reduction program and publish estimates of both the number of leaks in the system and their subsequent reduction.

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***Industrial and private sector involvement***

- 4.118** The Committee believes that the success of Bluescope Steel in Wollongong in the reuse of recycled water and feasible initiatives such as the projects at Kurnell being considered by Caltex, should be encouraged.
- 4.119** As shown above, water recycling is a key component in a more sustainable integrated water management plan for Sydney. The Committee believes that water recycling generally should be explored as thoroughly as possible and encourages proposals from and the engagement of, the private sector in relation to water recycling or reuse projects. The Committee recommends that Sydney Water develop a transparent measure through which to weigh the costs and benefits to the community of private involvement in water reuse initiatives.
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**Recommendation 9**

That Sydney Water develop transparent measures through which to weigh the costs and benefits to the community of private involvement in water reuse initiatives.

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## Chapter 5 The demand for water in Sydney

As noted in the Government's Progress Report of February 2006, improving water efficiency or demand management is one of the most effective methods of reducing long-term pressure on Sydney's water supplies.<sup>245</sup>

The Government has a number of long-term initiatives aimed at reducing the demand for water. These include the establishment of a demand management fund for businesses and councils that develop or assist in the development of new water saving initiatives, enhanced requirements for councils and businesses to ensure they are implementing cost effective water efficiency measures and ensuring that government agencies are developing and implementing water conservation plans.<sup>246</sup>

### Pricing

**5.1** The Metropolitan Water Plan 2004 noted the opinion of some experts that 'water has historically been undervalued' in Sydney. The plan went on to state:

The Government recognises that a change in the pricing structure for water supplied to Sydney's urban users – both households and businesses – can help reduce the demands on our finite supplies.<sup>247</sup>

**5.2** Sydney Water does not have jurisdiction over the pricing of water in Sydney – this is the role of the Independent Pricing and Regulatory Tribunal (IPART).

**5.3** In October 2005, IPART released a report entitled *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region*. This report was produced in response to a request from the NSW Government to IPART to 'review and provide advice on pricing principles and alternative arrangements for the delivery of water and wastewater services in the greater Sydney region, including possible private sector involvement.'<sup>248</sup>

**5.4** The IPART report included a pricing determination for charging households a higher price for water used 'above a certain reasonable volume', as well as a reduction of the fixed component of household water bills, in order to provide consumers with additional incentive to reduce their water consumption.<sup>249</sup>

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<sup>245</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p8

<sup>246</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p16

<sup>247</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p19

<sup>248</sup> Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region: Final Report*, October 2005, p1

<sup>249</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p19

- 5.5 This pricing determination, for water and sewerage services is for the next four years in Sydney, Illawarra and the Blue Mountains and came into effect on 1 October 2005.<sup>250</sup> In answers to questions on notice, Sydney Water supplied the Committee with two tables, outlining their pricing regime for metered and commercial and industrial properties.<sup>251</sup> These tables are reproduced below:

**Table 5.1: Sydney Water usage charges for filtered and unfiltered water to metered properties (2005/2006 dollars)**

|                               | Commencement date to 30 June 2006 (\$/kL) | 1 July 2006 to 30 June 2007 (\$/kL) | 1 July 2007 to 30 June 2008 (\$/kL) | 1 July 2008 to 30 June 2009 (\$/kL) |
|-------------------------------|---|-------------------------------------|-------------------------------------|-------------------------------------|
| Water usage charge            | \$1.20                                    | \$1.23                              | \$1.26                              | \$1.31                              |
| Unfiltered water usage charge | \$0.78                                    | \$0.78                              | \$0.78                              | \$0.78                              |

Source: Sydney Water, answers to questions on notice taken during evidence 23 March 2006, Question 8

**Table 5.2: Sydney Water service charge for commercial and industrial properties (2005/2006 dollars)**

|                   | Commencement date to 30 June 2006 (\$) | 1 July 2006 to 30 June 2007 (\$) | 1 July 2007 to 30 June 2008 (\$) | 1 July 2008 to 30 June 2009 (\$) |
|-------------------|--|----------------------------------|----------------------------------|----------------------------------|
| 20 mm connection  | \$56.84                                | \$62.65                          | \$52.85                          | \$43.87                          |
| 150 mm connection | \$3,197.24                             | \$3,524.34                       | \$2,972.84                       | \$2,467.54                       |

Source: Sydney Water, answers to questions on notice taken during evidence 23 March 2006, Question 8

- 5.6 Sydney Water stated that the new pricing structure aims to encourage households and businesses to use water more wisely by reducing the fixed water charge and increasing the charge for water usage.<sup>252</sup>

### Domestic consumers

- 5.7 During the inquiry, a number of witnesses told the Committee that water was not priced in such a way that recognised the necessity and scarcity of the resource. Mr Ian Kiernan, Executive Chairman of Clean Up Australia Ltd told the Committee water should be priced in a way that more adequately reflects its value. At the same time, Mr Kiernan noted the need to ensure that water was affordable for the whole community and that more economically vulnerable people were protected from large price increases:

<sup>250</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr David Evans, Managing Director, Sydney Water, Question 8, p9

<sup>251</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 8, p8

<sup>252</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 8, p9

The water in the jug is \$1.03 a tonne and the bottled water is \$3,000 a tonne. Water is too cheap. I think the pricing tool is useful. But what happens with the family of six struggling on \$30,000 a year? An increase in the price of water will be very difficult for them. I believe we are paying more for our water than we pay through our rates. I think we are paying it in other ways. We have seen an increase from 87c to \$1.03 and I think we will see further increases. I think we need to look at relief for battlers so, like a pensioner, they get some sort of reduction if they are below a certain income level and above a certain family size. I think that would be fair and reasonable. How difficult that would be I do not know.<sup>253</sup>

- 5.8** Mr Robert Wilson, a member of the Hawkesbury-Nepean Catchment Authority Board, also recommended that water be priced in a way that reflects consumption. He suggested that families who may struggle to pay the additional cost may be given a rebate, as happens for other services, such as transport services and rental assistance:

I think you need step pricing. I know the problems with step pricing. People who say, "But we have got to look after a large family," do not recognise that there are ways of looking after large families in a regulatory process that allows you to give them some relief, but still caps the amount of water that people would use normally and then gives other people an allowance, because that is what happens with most welfare systems now: we recognise the size of families and those with particular problems. We do not give anyone an incentive for looking for their own ways to save water.<sup>254</sup>

- 5.9** Professor Charles Essery, an independent water consultant, also recommended a similar approach to reviewing pricing arrangements for people who were unable to incorporate a water price increase into their budget. In addition, he noted that the current cost of water services is far below that of other countries, particularly in Europe:

We know that Sydney pays about a third of what is paid by other first-world countries, the likes of Europe. Three dollars a kilolitre is horrendous. I must admit to being very surprised when people say, "What about the poorer families that cannot afford that?" That is absolute bunkum. There are community service obligations in the Sydney Water operating licence that have to be dealt with, and there are similar community service obligations on every local government authority that runs a water authority in country New South Wales, and those are used for that very purpose.<sup>255</sup>

- 5.10** Mr Matt Mushalik, a civil engineer, compared the cost structure used by Sydney Water to the cost structure used in Frankfurt, Germany. The costs outlined by Mr Mushalik suggest that in Germany the costs of stormwater drainage and the actual price of water consumed per kilolitre were far higher than those charged by Sydney Water.<sup>256</sup> As Mr Mushalik noted, the cost of water was more expensive in Frankfurt, but sewerage services and water treatment services are included in the cost, so that over 80% of the bill is variable because it reflects consumption.<sup>257</sup>

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<sup>253</sup> Mr Kiernan, Evidence, 10 March 2006, p6

<sup>254</sup> Mr Wilson, Evidence, 20 March 2006, p44

<sup>255</sup> Professor Essery, 10 March 2006, p14

<sup>256</sup> Submission 27, Mr Mushalik, p3

<sup>257</sup> Submission 27, Mr Mushalik, p3

- 5.11** Similarly, Mr Robert Shaw, a retired water and chemical engineer told the Committee that water in Sydney is not priced to encourage saving and that a method of encouraging recycling and rain water substitution would be to make the variable charge associated with consumption, higher.<sup>258</sup>
- 5.12** This issue was also raised by Dr Stuart Khan, Research Fellow at the Centre for Water and Waste Technology at the University of New South Wales, who told the Committee that pricing was not structured to encourage the saving or the recycling of water from a cost benefit perspective:

I was looking at my recent Sydney Water bill and my last bill was for \$133, of which \$94 is for the sewerage system, nearly \$20 is for the water service and only \$12 was my usage fee for water. So for one point, there is not a lot of potential elasticity there; I cannot do anything really to save a lot of money on that bill; I have \$12 out of that \$133 that I have any power over. But, more importantly, if we are talking about water recycling, traditionally the costs for tertiary treatment have been applied to the sewerage generators – the sewerage service costs here – and that is the largest part of my bill, that is the \$94.<sup>259</sup>

- 5.13** Dr Khan also suggested that the cost of drinking water be increased, while reducing the price of sewerage services. He argued that this kind of structure may mean that the consumer may not actually pay more, but that the usage charge for water ‘becomes more elastic’ or variable.<sup>260</sup> At the same time, the use of recycled water would be encouraged because although recycled water would incur an additional charge, it would be offset by a reduction in the cost of sewerage services:

... when Sydney Water or any other organisation wants to put in a recycled water scheme and they want to look at the cost to the consumer of what a person would be prepared to pay compared with recycled water, it moves the bar upwards without actually costing anybody any more because it comes off the sewerage service fee. So I think some things like that would be worth taking a good look at.<sup>261</sup>

- 5.14** Mr Leigh Martin, Urban Campaigner from the Total Environment Centre noted the difficulties that Sydney Water may incur through reducing the fixed component of water charges and raising the variable component. Nonetheless, he argued for the importance of this structure for the incentive it provides householders to reduce their water consumption. Mr Martin noted that the most recent pricing changes introduced by the IPART reflected a reduction in the level of fixed charges and an ‘increasing reliance on volumetric rate’:

We would like to see that process continue, fixed charges significantly decreased and a greater reliance on [variable] charges. I understand why Sydney Water would resist that, because from a utilities point of view fixed charges offer a greater degree of certainty in terms of their revenue stream whereas a greater reliance on uses charges exposes them to greater revenue volatility. But the tribunal has considered measures to address that and they certainly have done that in their previous report on price

<sup>258</sup> Submission 31, Mr Shaw, pp3-4

<sup>259</sup> Dr Khan, Evidence, 20 March 2006, p13

<sup>260</sup> Dr Khan, Evidence, 20 March 2006, p13

<sup>261</sup> Dr Khan, Evidence, 20 March 2006, p13

structures to reduce demand for water in the Sydney basin. I think there certainly is an avenue there in future pricing reviews to further reduce the level of fixed charges.<sup>262</sup>

- 5.15** Finally, Mr Peter Prineas, Member of the Executive of the Nature Conservation Council of New South Wales, told the Committee that he believed that the IPART determination went some way to addressing the historical under-valuation of water and that this trend would lead to the better conservation of water in the long term:

In relation to prices, we say that prices have been too low for many years for water. The first 10 years of IPART decision making saw the urban water price fall significantly in real terms. You could say in IPART's defence that this was a function of making the water industry more efficient so it was not entirely a bad thing. However, with the price of water falling in real terms, the incentive for investment in water conservation was low. Recent IPART determinations have gone some way to correcting this trend and price increases have been allowed which are considerable and likely to make a difference. Prices for recycled water need to be high enough to promote investment and low enough to make the product attractive compared with the price of mains water.<sup>263</sup>

- 5.16** The Committee notes that in a presentation at the Australian Water Summit 2006 in Sydney, Mr Tony Kelly of Yarra Valley Water in Melbourne presented a sample water bill from Yarra Valley Water. This bill not only itemised the water usage of the household compared to its own averages, but also provided figures for standard water usage for households of different sizes as well as efficient water usage figures.<sup>264</sup>
- 5.17** In response to the question from the Committee on innovative billing, Sydney Water advised that it is participating in the expert panel that is part of a Council of Australian Governments' (COAG) water initiative that is drawing up national guidelines for customers' water accounts. These guidelines will provide information on customers' accounts on their water use relative to other households in the community.<sup>265</sup> Sydney Water also advised it had a number of other initiatives to encourage customers to conserve water, including education campaigns, advertising and water saving programs.<sup>266</sup>

### **Industrial consumers**

- 5.18** As discussed in the previous chapters,<sup>267</sup> industry consumes 12% of potable water in the Sydney region. Mr Kiernan told the Committee that an increase in the cost of water would encourage industry to take new measures, including the recycling of water in order to reduce expenditure:

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<sup>262</sup> Mr Martin, Evidence, 10 March 2006, p45

<sup>263</sup> Mr Prineas, Evidence, 20 March 2006, p20

<sup>264</sup> Mr Tony Kelly, Yarra Valley Water, *Presentation*, Australian Water Summit, Sydney, 14 March 2006

<sup>265</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 12, p15

<sup>266</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 12, p15

<sup>267</sup> See Chapter 4, 4.48 – 4.57

I think industry is going to recognise that water is going to increase in cost and when they do those projections and do their water audit and see if they can avoid taking drinking water, and recycle the water, I think that when they do the projections it might help them make those decisions to bullet-proof them against those price increases in the future.<sup>268</sup>

## Water restrictions

**5.19** As a result of the drought, water restrictions are in place for Sydney residents and businesses. At the moment, level 3 restrictions apply, which prevent users from using water systems and sprinklers and hosing hard surfaces, including vehicles. Hand held hosing of gardens is only permitted on Wednesday and Sunday before 10am and after 4pm.<sup>269</sup>

**5.20** Mr David Evans, Managing Director of Sydney Water, advised the Committee that, after the drought has ended and the drought restrictions have been lifted, long term measures would be examined to continue the water conservation behaviours adopted during the drought:

Experience around Australia is showing us that there are two sets of restrictions that must be considered. One of them is drought restrictions, which are the restrictions we now have in place. The Government has indicated that it will not be implementing any additional drought restrictions over and above the ones we now have. The other issue is how to encourage water efficiency when we are not experiencing drought. That must be integrated with community education and all that goes with it. We will be looking at that as we come out of the drought, because we want to encourage continuation of the water awareness that has emerged during the drought. There is evidence from different jurisdictions that one can often lock in more efficient use behaviour through some of the habits that have been developed during drought restrictions.<sup>270</sup>

**5.21** Mr Martin told the Committee of the importance of permanent water restrictions, as part of a long-term, sustainable water management plan. He argued that restrictions have been well received by the community and that, as people have adjusted to more sustainable use of water, it is important to build on that, not to 'abandon those gains.'<sup>271</sup> Mr Martin noted that Melbourne and Adelaide have adopted permanent restrictions as part of their long-term water management plans.<sup>272</sup>

**5.22** In turn, in her submission made in a private capacity, Ms Laura Eadie suggested that the community response to mandatory water restrictions during the recent drought indicates that a cultural shift toward more effective water use has begun.<sup>273</sup> She argued that the introduction of pricing reforms would only continue this trend.

<sup>268</sup> Mr Kiernan, Evidence, 10 March 2006, p8

<sup>269</sup> Sydney Water website <[www.sydneywater.com.au](http://www.sydneywater.com.au)> (accessed 4 May 2006)

<sup>270</sup> Mr Evans, Evidence, 23 March 2006, p14

<sup>271</sup> Mr Martin, Evidence, 10 March 2006, p41

<sup>272</sup> Mr Martin, Evidence, 10 March 2006, p40

<sup>273</sup> Submission 41, Ms Eadie, pp3-4

- 5.23** Similarly, Mr Prineas argued that people adjust to water restrictions over the long-term and that they adjust to a more restricted approach to water use:

When people get used to a particular regime, provided it has a good rational basis, they are more likely to accept it. It just becomes part of the background. I have not seen any recent research about community attitudes, but my impression is that the water restrictions are well accepted. There are some people who will object, but most people accept the need for them and feel somewhat involved in the whole process of meeting Sydney's water problem by making this contribution. So I think it is a realistic response to our environmental reality. We do not have a lot of water and we should not be wasting it.<sup>274</sup>

- 5.24** Mr Wilson of the Hawkesbury-Nepean Catchment Authority also believed that water restrictions should remain in place:

I would keep the water restrictions on, even if we get some rain. I think Sydney has grown up a little in the last few years in that it now once again understands it has to save water. I applaud governments that put on water restrictions at times like that. I know that politicians I talk to always get worried about those things, but I have applauded governments that have done that in the past. I think it has been a good thing to discipline Sydney. So you need to discipline Sydney. I think you need to build up recycling. You need to go to industry and say: It is your turn to start working with us.<sup>275</sup>

- 5.25** However, the Committee notes that Professor Essery argued that long-term water restrictions were not an effective method of promoting water conservation practices as, over time, consumption is effected by so-called demand hardening:

I have not looked at the figures but I would predict that Sydney Water consumption is probably now at least 30 or 40 gegalitres higher than it was at the peak of the effectiveness of the restrictions. It is a common human behaviour. People get fed up. I do not grow roses – I hate gardening – but if someone has spent 30 years producing roses why should they not be allowed to water the garden? If someone is mad on washing the car why should he not be allowed to use a trigger hose to wash the car? It is about the freedom of being allowed to do what you want to do provided you are paying for the consequence of it. If we had recycled water and we used stormwater and rainwater we would have no need for restrictions.<sup>276</sup>

## **Sydney Water's operating targets for water consumption**

- 5.26** In its 2004/2005 Water Conservation and Recycling Implementation Report, Sydney Water indicated that it exceeded its operating targets for water consumption from the Sydney Catchment Authority (SCA) in 2004/2005. A number of reasons were provided for this, including an underestimation of the time required to complete the water recycling project at

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<sup>274</sup> Mr Prineas, Evidence, 20 March 2006, p21

<sup>275</sup> Mr Wilson, Evidence, 20 March 2006, p42

<sup>276</sup> Professor Essery, Evidence, 10 March 2006, p21

Bluescope Steel.<sup>277</sup> As a result of the additional demand, Sydney Water had to pay additional costs for water over and above the operating targets.

- 5.27** A paradox a number of witnesses noted is that Sydney Water actually profits from the sale of this additional water through its charges to customers. In effect, the failure to meet an operating target means added revenue. Mr Martin explained the conflicting objectives:

I think it needs to be recognised that Sydney Water is an organisation that has conflicting objectives placed upon it. In one respect, there are requirements within Sydney Water's operating licence for that organisation to meet demand management targets – which it has not succeeded in meeting to date. There are also requirements on Sydney Water to return a dividend on the public investment in the organisation's infrastructure and to return a dividend to government ... At the moment, if Sydney Water fails to meet its demand management targets it will, by selling water, earn greater revenue and return a greater dividend to government.<sup>278</sup>

- 5.28** Mr Martin continued that when setting the price of water, IPART makes price assumptions based on Sydney Water's operating targets. As a result of Sydney Water not meeting those targets, but in fact selling more water, IPART estimated that Sydney Water made between \$36 million and \$72 million in additional revenue.<sup>279</sup>

- 5.29** Mr Prineas told the Committee that a form of payment or penalty pricing should be investigated in relation to Sydney Water's purchase from the SCA:

The Committee should consider recommending penalty pricing by the Sydney Catchment Authority [SCA] when Sydney Water buys water from the SCA in excess of its operating licence targets. This has been proposed by us, but not at this stage supported by the Independent Pricing and Regulatory Tribunal.<sup>280</sup>

## Water Savings Fund

- 5.30** The Water Savings Fund is a fund provided by the Government to assist businesses and councils to develop water savings projects that require significant funding to commence. The fund has a grant of \$130 million over four years.<sup>281</sup> As noted in the February 2006 Progress Report, the Government established the Water Savings Fund in 2005 to improve water efficiency, promote alternative sources of water and stimulate investment in water technologies. The fund is managed by the Department of Energy, Utilities and Sustainability, with funding from Sydney Water.<sup>282</sup>

- 5.31** Mr David Nemptow, Director General of the Department of Energy, Utilities and Sustainability, explained the purpose and grant allocation of the Water Savings Fund,

<sup>277</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, pp6-7

<sup>278</sup> Mr Martin, Evidence, 10 March 2006, p42

<sup>279</sup> Mr Martin, Evidence, 10 March 2006, p42

<sup>280</sup> Mr Prineas, Evidence, 20 March 2006, p19

<sup>281</sup> Mr Nemptow, Evidence, 23 March 2006, p15

<sup>282</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, p2

particularly to councils, for whom a grant allocation is intended to fund projects which would not otherwise happen:

These funds are available as grants. If someone wanted a loan, we would certainly entertain that, but we find that almost everyone prefers a grant to a loan for obvious reasons. That allows these projects to go forward. We have an independent panel of experts to help us. The secret is to support activities, whether it is with councils, businesses or whomever it might be, that would not have happened without the fund. The fund has limited resources and we want to ensure that it is used for projects that we can get over the line that would not happen otherwise. That is the hardest part of reviewing all the applications we receive.<sup>283</sup>

- 5.32** The Committee notes that a water saving pilot fund was delivered in 2004/2005 totalling \$2.5 million. It was dispersed among a number of different projects, including a grant of \$91,000 for increased stormwater harvesting and grey water reuse by the Sydney Harbour Foreshore Authority, \$168,000 for flow restrictors at Westmead Hospital and \$56,000 for a stormwater reuse for irrigation project at Parramatta stadium.<sup>284</sup>
- 5.33** The water saving pilot fund will be finalised by 2006/2007, with further projects may be funded through the Water Savings Fund.<sup>285</sup> Based on the estimates provided by applicants,<sup>286</sup> Sydney Water expects that by 2010/2011 the projects resulting from the pilot fund will be saving approximately 950 megalitres per annum.<sup>287</sup>
- 5.34** The first round of the Water Savings Fund opened in late 2005 and attracted more than 70 applications. In February 2006, offers totalling more than \$9.2 million were made to 27 water use efficiency and recycling projects. The second round was opened in March, with grants to be announced in the coming months. Two to three funding rounds will be held each year, involving a public call for applications.<sup>288</sup>

## **BASIX (Building Sustainability Index)**

- 5.35** In its Water Conservation and Recycling Implementation Report 2004/2005, Sydney Water indicated that in total, single dwellings are the largest consumer of water in Sydney, consuming 51% of all water supplied by Sydney Water. This compares with other uses: industrial (12%), commercial (10%) and government (8%).<sup>289</sup> This is shown in Figure 2.2.
- 5.36** In an effort to achieve water use reductions by the residential dwelling sector, the Government has required that all new houses reduce water use be 40% under the BASIX

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<sup>283</sup> Mr Nemptzow, Evidence, 23 March 2006, p15

<sup>284</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, pp23-24

<sup>285</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, p55

<sup>286</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, p83

<sup>287</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, p70

<sup>288</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p42

<sup>289</sup> Sydney Water Corporation, *Water Conservation and Recycling Implementation Report*, p5

(Building Sustainability Index) planning system, implemented in July 2004. The broad aims of the BASIX initiative were described by Mr Evans in evidence:

Under the BASIX laws new developments, no matter where they are, have to be 40 percent more water efficient than previously. That creates the incentive for the development community to install what we call dual pipe systems to allow water to be reused in gardens and toilet flushing and the like, and as the development unfolds we expect to see that unfold to hundreds of thousands of properties.<sup>290</sup>

**5.37** The Metropolitan Water Plan 2004 outlined a number of methods of reducing domestic residential water consumption to meet the BASIX requirements, such as water efficient fixtures (for example, dual flush toilet or low flow showerheads), the installation of a rainwater tank, or connection to a recycled water supply.

**5.38** The Metropolitan Water Plan 2004 also indicated that the BASIX water efficiencies would apply to 'alterations and additions to all dwellings' from October 2005.<sup>291</sup> This date was updated to July 2006 in the Metropolitan Water Plan 2006.<sup>292</sup>

**5.39** Mr Sam Haddad, Director General of the Department of Planning (DoP), outlined the predicted future savings of the BASIX initiative:

Over the next 10 years it is estimated that 300 gegalitres of water will be saved across New South Wales, with the equivalent of about 140 gegalitres in Sydney due to the application of BASIX. To date we have dealt with almost 20,000 certificates issued under the BASIX initiative.<sup>293</sup>

**5.40** In answers to questions on notice, the DoP indicated to the Committee the seven residential dual reticulation water-recycling schemes included under BASIX to date:

- Rouse Hill (currently operational, see chapter 4)
- Sydney Olympic Park (currently operational, see chapter 4)
- Hoxton Park
- Ropes Crossing
- Ballina Heights
- Ploughmans Valley and North Orange
- Perradenya Estate.<sup>294</sup>

<sup>290</sup> Mr Evans, Evidence, 23 March 2006, p6

<sup>291</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p6

<sup>292</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p70

<sup>293</sup> Mr Haddad, Evidence, 23 March 2006, pp26-27

<sup>294</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Sam Haddad, Director General, DoP, covering letter, pp1-2

**5.41** These last five developments are in various stages of planning or construction, however only Hoxton Park and Ropes Crossing are in Sydney.<sup>295</sup>

**5.42** Mr Wilson told the Committee that BASIX is an important step towards water efficiency, not only at the householder level, but also at the urban design level:

If you think about the design of a suburb, it is quite easy to design a suburb that is attractive to live in but that does not demand a lot of water, because you can trap water, capture overland flows and all those sorts of things. Even if you cannot always put a water tank in a particular house, you can put it in a particular landscape that that house sits in. So there need to be some incentives for developers as well – and BASIX does that of course.<sup>296</sup>

**5.43** However, Mr Martin told the Committee that while BASIX is an ‘excellent reform and an essential step towards water and energy sustainability’,<sup>297</sup> it may need to be strengthened in the future. He recommended that BASIX continue to be reviewed to ensure it remains an appropriate method of promoting water efficiencies in new developments and renovations:

It may be that in future technology to make homes more water efficient will improve and it may be possible to cost effectively achieve a higher standard for new dwellings than can be achieved now. So, the standards in BASIX may need to be reviewed in the future if technology improves and a higher level of water efficiency is more easily achieved.<sup>298</sup>

## **Water efficiency in the home**

**5.44** The Government has in place a range of initiatives to encourage householders to install water saving appliances, such as showerheads, washing machines, dual flush toilets and dishwashers.<sup>299</sup> These include manufacturing requirements such as labelling for water efficiency and the development of a ‘Smart Water Mark’ to indicate water efficient plants, garden designs and irrigation equipment.<sup>300</sup> The Committee examines some of these initiatives below.

### ***Indoor Waterfix program***

**5.45** The Waterfix program was launched in January 2000. This program provides water efficient shower heads and other water saving devices to customers. So far, approximately 310,000 properties have had water efficient showerheads and plumbing devices installed. More than 367,000 AAA rated showerheads have been fitted to date. Sydney Water estimates this

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<sup>295</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Haddad, covering letter, p1

<sup>296</sup> Mr Wilson, Evidence, 20 March 2006, p44

<sup>297</sup> Mr Martin, Evidence, 10 March 2006, p43

<sup>298</sup> Mr Martin, Evidence, 10 March 2006, p43

<sup>299</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p17

<sup>300</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p17

program will save approximately 8.2 gigalitres of potable water per annum by 2015.<sup>301</sup> Sydney Water is also offering a \$150 rebate on water efficient washing machines from March 2006 – March 2007.<sup>302</sup>

### ***Do-It-Yourself Water Saving Kits***

- 5.46** The ‘Do-It-Yourself’ Water Saving Kits were introduced as a pilot program in November and December 2004. The Kits provide householders with pressure reducing valves that can be installed without changing the showerhead.<sup>303</sup> Sydney Water estimates that 5,900 households have participated in the program, resulting in water savings of 43 megalitres per year.<sup>304</sup>

### ***Landscape Assessment Program***

- 5.47** The Landscape Assessment Program aims to determine the irrigation demands of individual landscapes and identify the gap between typical irrigation application rates and the assessed irrigation demand.<sup>305</sup> In 2004-2005, Sydney Water estimated that almost 1,500 households were assessed.<sup>306</sup>

### ***Rainwater Tank Rebate Program***

- 5.48** Since the Rainwater Tank Rebate program was launched in 2002, the number of rebates has increased to an average of 1,050 per month. Around 20,800 rebates have been paid, and the program is estimated to have reduced demand by 760 megalitres per year.<sup>307</sup>
- 5.49** The Government has also funded a number of education programs designed to encourage the community to save water.<sup>308</sup> They include the *Go Slow on the H<sub>2</sub>O* education campaign, to encourage a reduction in outdoor water use and the *Dams So Low* advertising campaign to promote indoor water saving initiatives. Sydney Water is also involved in other promotional activities, including trade and garden shows, water-efficient display homes and school education programs.<sup>309</sup>
- 5.50** While witnesses were generally positive about these initiatives, some suggested that more could be done. For example, Professor Nicholas Ashbolt, Head of School of Civil and Environmental Engineering at the University of New South Wales, described other measures in use in Europe, which he believed could be successfully applied to Sydney households:

<sup>301</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p72

<sup>302</sup> NSW Government, *February 2006 Progress Report: Securing Sydney’s Water Supply, Metropolitan Water Plan*, 8 February 2006, p9

<sup>303</sup> Mr Evans, Evidence, 23 March 2006, p20

<sup>304</sup> <[www.sydneywater.com.au/savingwater](http://www.sydneywater.com.au/savingwater)> (accessed 8 April 2006)

<sup>305</sup> <[www.sydneywater.com.au/savingwater](http://www.sydneywater.com.au/savingwater)> (accessed 8 April 2006)

<sup>306</sup> <[www.sydneywater.com.au/savingwater](http://www.sydneywater.com.au/savingwater)> (accessed 8 April 2006)

<sup>307</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p74

<sup>308</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p17

<sup>309</sup> <[www.sydneywater.com.au/savingwater](http://www.sydneywater.com.au/savingwater)> (accessed 8 April 2006)

... if you are looking at the wastewater currently in a sewer, about 80 per cent of the nitrogen and somewhere around 50 per cent to 60 per cent of the phosphorus is contributed just from the urine stream alone in sewage and the urine is less than 1 per cent of the total flow in that sewer ... there are urine diversion toilets available commercially in Scandinavia and Germany, which actually keep the urine separate in the first place. That is one option, to have urine diversion toilets. We know, of course, that urinals are already in existence through all public buildings and large public places, so we already have the potential to keep that urine separate.<sup>310</sup>

- 5.51** Councillor Sam Byrne, Mayor of Marrickville Council and representative of the Local Government and Shires Association of New South Wales, told the Committee of the need, in his view, for mandatory retrospective fitting of water saving devices for all dwellings:

We also think there should be mandatory retrofitting of all publicly and privately owned buildings with water-efficient fittings and appliances. That should be mandatory and we should be getting on with that now. We think that we should no longer be able to make appliances that are not water efficient. We have a system that tells us how water efficient an appliance is. We should not be able to make inefficient ones; we should only be able to make efficient ones. The fourth point I highlight is that we need to engage the community more in this process. We need to ensure that we bring the community along with us.<sup>311</sup>

- 5.52** In turn, Mr Prineas of the Nature Conservation Council told the Committee that while Sydney Water was using various water saving initiatives to target residential water use, it had not been able to meet its operating target and, without water restrictions, is not on track to meet the next target in 2010/2011.<sup>312</sup>

- 5.53** In response, Mr Evans told the Committee that Sydney Water's water saving initiatives would be constantly reviewed and upgraded, with a focus on ensuring new homes are water efficient:

The other thing you have to do is push out the frontiers. Some of these other things are more expensive but we have introduced the \$150 subsidy for water efficient washing machines. That is designed to increase the uptake of those types of machines, but it is also designed to change the social attitude; to get people to realise they work. One person has one and the neighbour looks at it and all that sort of thing. Something we are looking at but will have to do pilot studies on is this question of retrofitting the dual flush toilets. Dual flush toilets are required in all new properties, so that sort of takes care of itself, but it is a big opportunity for improvement in established properties.<sup>313</sup>

## **Water saving measures for government**

- 5.54** In the 2006 Progress Report, the Government announced water saving measures with a focus on organisations for which the Government has responsibility. These include:

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<sup>310</sup> Professor Ashbolt, Evidence, 20 March 20056, p35

<sup>311</sup> Clr Byrne, Evidence, 10 March 2006, p29

<sup>312</sup> Mr Prineas, Evidence, 20 March 2006, p23

<sup>313</sup> Mr Evans, Evidence, 23 March 2006, p2

- retrofitting more Department of Housing homes, bringing the total number of public housing properties that have been retrofitted to 75,000
- improving water efficiency at Government owned facilities, including hospitals, correctional facilities and TAFE campuses
- assisting an initial selection of 20 public schools to improve their water efficiency by reducing leaks.<sup>314</sup>

- 5.55** The Government estimates that together, these programs will save 14 megalitres of water per day.<sup>315</sup>
- 5.56** In its Metropolitan Water Plan 2006, the Government emphasised its commitment to improving the water efficiency of government agencies. The Government advised that the target is to reduce water consumption by government agencies by 15% by 2010/2011, or around 1 gigalitre per year.<sup>316</sup>
- 5.57** The Metropolitan Water Plan 2006 also advises that 113 schools have now completed the Every Drop Counts in Schools program, which potentially deliver water savings of around 181 megalitres per annum.<sup>317</sup>

### Metering for high density housing

- 5.58** In the Metropolitan Water Plan 2006, the Government advised that under the current system approximately 40% of households do not pay individual water usage charges and that households which are not individually billed generally use more water.<sup>318</sup> As the number of multi-unit residences grows, Sydney Water will trial individual metering in multi-unit apartment blocks.<sup>319</sup> The trial is to determine cost benefit analysis of individual metering. A report is due in early 2007.<sup>320</sup>
- 5.59** Witnesses to this inquiry encouraged individual metering for high density housing, such as flats and apartment blocks that could be measured in the same way electricity is measured. Mr Young of the Water Services Association of Australia told the Committee:

We are watching very closely the developments in the electricity industry with Smart metres, particularly charging for electricity during peak periods – and the water industry is no different – to see whether we can piggyback off some of that work...

<sup>314</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p9

<sup>315</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p9

<sup>316</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p62

<sup>317</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p63

<sup>318</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p58

<sup>319</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p58

<sup>320</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p58

- 5.60** Mr Young suggested that a metering inspector could read both water and electricity meters, reducing the costs of inspections and that with improvements in technology costs could come down, as water meters became able to produce more sophisticated readings:

Both in the reading and in the technology of the metres, and that is improving all the time. I think the cost could become prohibitive if we had to use the old style of metering. But I am confident that as metering technology improves, the costs will come down and we will be able to get smarter in regard to time-of-use metering or metering of water for different uses, perhaps with a different price for water internally as compared with externally to the household.<sup>321</sup>

- 5.61** Professor Essery also highlighted the possibility that the person employed to conduct gas and electricity readings could also take the water consumption readings. He argued:

Their reading can be done by someone who does the readings for electricity and for gas. If we have individual electricity meters, why could we not regulate the process to have gas, electricity and water all read by the same person?<sup>322</sup>

- 5.62** Sydney Water is examining the feasibility of requiring individual metering on new medium and high-rise buildings. This will become more important as the mix of new housing shifts from free standing houses to a higher proportion of strata units. Sydney Water is conducting a project to pilot individual unit metering. The pilot project includes the installation of individual water meters in two new multi-unit buildings; one building involves the manual reading of individual meters and the other uses internally installed data loggers and General Packet Radio Signal systems to remotely record the water usage.

## Committee comment

- 5.63** The Committee recognises the complexity of altering the pricing structure for the provision of water, especially as it affects the economically vulnerable. However, the Committee believes that the cost of water does not currently reflect its value as a scarce and essential resource. The Committee recommends that, in the course of its next round of deliberations, the IPART consider altering the price structure of water further in favour of variable costs over fixed ones. This may require the Government to investigate appropriate subsidies or other forms of assistance for the economically vulnerable.
- 5.64** On IPART's recommendation, Sydney Water is implementing a program of assistance to those in economic hardship. Included in these measures are 'safety net' provisions, including free residential retrofits of water-saving appliances and a rebate of up to \$40 annually for large low-income families.<sup>323</sup>

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<sup>321</sup> Mr Young, Evidence, 20 March 2006, p48

<sup>322</sup> Professor Essery, Evidence, 10 March 2006, p14

<sup>323</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p57

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### **Recommendation 10**

That, during its next round of deliberations, the Independent Pricing and Regulatory Tribunal consider altering the price structure of water further in favour of variable costs over fixed ones. This may require the Government to investigate appropriate subsidies or other forms of assistance for the economically vulnerable.

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- 5.65** The Committee also strongly supports the development of a quarterly water bill that informs consumers of their water costs compared to the average consumed by similar households in the community. The Committee recommends that Sydney Water implement such a bill when the national guidelines being developed by COAG are completed.
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### **Recommendation 11**

That Sydney Water produce a quarterly water bill that informs consumers of their water costs compared to the average consumed by similar households in the community, based on the national guidelines currently being developed by the Council of Australian Governments.

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#### ***Industrial consumers***

- 5.66** The Committee notes that industry consumes 12% of Sydney's potable water, but of all consumers seems the least likely to require potable water for its uses. As indicated in the previous chapter, the Committee strongly supports the initiatives in place at plants such as the Bluescope Steel steelworks and the recycled water initiative being developed at Camellia. The Committee encourages Sydney Water to promote these initiatives to industry.

#### ***Water restrictions***

- 5.67** The Committee majority believes that water restrictions are an important part of the Government's water plan for Sydney in drought periods. The majority agrees with the position in the 2006 Metropolitan Water Plan that people should be encouraged to continue commonsense and practical water conservation behaviours after the drought has ended, to save a significant amount of water each year.<sup>324</sup>
- 5.68** The Committee recommends that the Government should expand and diversify its current community education campaigns to inform the community of the value of continuing commonsense and practical water conservation behaviours even in non-drought times.
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### **Recommendation 12**

That the Government expand and diversify its current community education campaigns to inform the community of the value of continuing commonsense and practical water conservation behaviours even in non-drought times.

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<sup>324</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p75

- 5.69 However, the Committee minority strongly believes that water restrictions are an important part of the Government's water management plan and supports the implementation of permanent water restrictions for Sydney. The Committee minority is conscious of the possibility of demand hardening and believes that Sydney Water develop expands and diversify its current community education campaign in inform the community of the importance and value of permanent water restrictions.

*Operating targets and the Water Savings Fund project*

- 5.70 The Committee recognises that while Sydney Water's operating licence required it to reduce the amount of water it supplies, there was a perverse revenue incentive not to meet the requirements of that licence. Accordingly, the Committee supports the suggestion that any extra revenue made by Sydney Water as a result of it failing to meet its water saving operating requirements should go towards the Water Savings Fund project.<sup>325</sup>
- 5.71 The Committee is very supportive of the Water Savings Fund project. The Committee encourages innovation and creativity in relation to furthering the sustainability of Sydney's water supply and believes councils and businesses should be provided with the opportunity to develop their water saving ideas and initiatives.

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**Recommendation 13**

That Sydney Water allocate revenue from the sale of water over and above the water saving operating targets to the Water Savings Fund.

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***BASIX***

- 5.72 The Committee believes BASIX is an important step toward achieving water efficiencies in the area of largest consumption, the residential sector. Accordingly, the Committee recommends that the NSW Department of Planning continue to monitor the success of BASIX, with a view to technological progress and the potential for BASIX to be expanded.

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**Recommendation 14**

That the NSW Department of Planning continue to monitor the success of the Building Sustainability Index, with a view to technological progress and the potential for the Building Sustainability Index to be expanded.

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***Water efficiency programs***

- 5.73 The Committee acknowledges the various programs Sydney Water has implemented to reduce residential water use. The Committee encourages Sydney Water to continue to expand and improve on these initiatives and to investigate other options, in use in other jurisdictions, that may be successful in metropolitan Sydney.

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<sup>325</sup> Mr Martin, Evidence, 10 March 2006, p43

- 5.74** The Committee believes ensuring government agencies are water efficient is a key element of the water savings programs and commends the Government on the initiatives it has implemented so far. The Committee encourages the Government to continue to ensure that all its agencies operate in a water efficient manner.
- 5.75** The Committee notes that in its Metropolitan Water Plan 2006, the Government set a target of a 15% reduction of water consumption by government agencies by 15% by 2010/2011, or around 1 gigalitre per year. The Committee endorses this target.

***Metering***

- 5.76** The Committee believes that Sydney Water should trial individual household water readings in high density housing, if possible in conjunction with simultaneous reading of gas and electricity meters, and that a cost benefit analysis of this trial be undertaken.

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**Recommendation 15**

That Sydney Water trial individual household water readings in high density housing, if possible in conjunction with simultaneous reading of gas and electricity meters, and that a cost benefit analysis of this trial be undertaken.

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## Chapter 6 Trade waste

The disposal of trade waste is an important environmental component of the water management process. Sydney Water has a number of policies and procedures in place to ensure that industry and commercial businesses deal with trade waste in an appropriate manner. However, the Committee is concerned that current trade waste disposal methods may compromise or limit the use of recycled water systems for metropolitan Sydney.

### Trade Waste

- 6.1** Trade waste is ‘any liquid and any substances contained in it, which may be produced at the premises from an industrial or commercial activity.’ It does not include domestic wastewater from residential premises or wastewater generated by persons using domestic fixtures at the workplace.<sup>326</sup> Some industries that discharge trade waste include paint manufacturers, food processors, metal finishers, service stations, restaurants and chemical manufacturers.<sup>327</sup>
- 6.2** Trade waste may contain high concentrations of harmful substances such as arsenic, cadmium, chlorinated hydrocarbons, cyanide, mercury and lead.<sup>328</sup> In order to prevent these substances from damaging people’s health, the environment and the sewer treatment system, Sydney Water has developed a trade waste policy and acceptance standards which provide strategies for controlling the amount and concentration of trade waste discharged into the sewerage system.<sup>329</sup> Acceptance standards ‘are generally limits applied to the concentration of substances in composite samples of trade wastewater discharge’.<sup>330</sup>
- 6.3** Once discharged into the sewerage system, trade waste is transported to a sewerage treatment plant. Sydney Water advises that from here, ‘solids are recycled into a nutrient rich organic product called biosolids which are used in agriculture, forestry and land rehabilitation.’ The water is recycled to irrigate farms and golf courses or used by Sydney Water’s sewage treatment plants or industry. Water which is not recycled is discharged to rivers and the ocean after treatment.<sup>331</sup> This discharge is regulated by the Department of Environment and Conservation (DEC).<sup>332</sup>
- 6.4** In evidence, Mr David Evans, Managing Director of Sydney Water, advised that trade waste that is not accepted by Sydney Water for treatment can be either treated by industry on-site, or

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<sup>326</sup> Sydney Water website <[www.sydneywater.com.au](http://www.sydneywater.com.au)> (accessed 11 May 2006)

<sup>327</sup> Sydney Water website <[www.sydneywater.com.au](http://www.sydneywater.com.au)> (accessed 11 May 2006)

<sup>328</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr David Evans, Managing Director, Sydney Water, Question 16 (p9 of transcript), p19

<sup>329</sup> Sydney Water website <[www.sydneywater.com.au](http://www.sydneywater.com.au)> (accessed 11 May 2006)

<sup>330</sup> Sydney Water, *Trade Waste Policy*, 2004, p9

<sup>331</sup> Sydney Water website <[www.sydneywater.com.au](http://www.sydneywater.com.au)> (accessed 11 May 2006)

<sup>332</sup> Mr Evans, Evidence, 23 March 2006, p9

it can be dealt with by 'industrial customers', such as Lidcombe Liquid Waste Treatment Plant.<sup>333</sup> Mr Evans continued:

... we do have a very strong program of banning trade waste that is harmful, at source – only accepting it, with appropriate trade waste charging, if we can accommodate it, and then monitoring.<sup>334</sup>

**6.5** A number of instruments under the *Protection of the Environment Operations Act 1997*, administered by the DEC, regulate Sydney Water's discharges from sewerage treatment plants.<sup>335</sup>

**6.6** Explaining the DEC's role in ensuring trade waste was treated before entering the rivers and ocean, Ms Lisa Corbyn, the Director General of the DEC, advised the Committee that a number of mechanisms are in place to monitor the amount of trade waste going into the ocean and rivers:

... after about 10 years of experience with dealing with individual chemicals in particular, there was concern that there might be a sort of synergistic effect within the effluent. So we developed a program to regulate them on whole effluent toxicity, as it is called, which does look at the toxicity of the effluent for all of the things that might be in it. We set very tough licence limits on them, and we require them to monitor toxicity once a month ... and then they report to us through their annual returns. So it is a very focused program in general.<sup>336</sup>

### Ocean outfalls

**6.7** The amount of water discharged through Sydney's ocean outfalls for 2004-2005 was 389,893 megalitres.<sup>337</sup> This is the equivalent of approximately 1,000 Olympic sized swimming pools of partially treated sewage pumped into the ocean each day. The majority of this water – 343,940 megalitres – was subject to primary treatment only. Water that had been subject to secondary treatment totalled 24,565 megalitres and tertiary treated water totalled 21,389 megalitres.<sup>338</sup>

**6.8** A number of instruments under the *Protection of the Environment Operations Act 1997*, administered by the DEC, regulate Sydney Water's discharges from sewerage treatment plants.<sup>339</sup>

<sup>333</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 20 (p10 of transcript), p24

<sup>334</sup> Mr Evans, Evidence, 23 March 2006, p10

<sup>335</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 17 (p9 of transcript), p21

<sup>336</sup> Ms Corbyn, Evidence, 23 March 2006, p28

<sup>337</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 10, p12

<sup>338</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 10, p12

<sup>339</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 17 (p9 of transcript), p21

- 6.9** Ms Corbyn explained that each sewerage treatment plant managed by Sydney Water requires a licence to deposit effluent into the environment through ocean outfalls and that the DEC have conducted ‘more extensive analysis of Sydney Water’s ocean outfalls than those of any other system’.<sup>340</sup> Ms Corbyn elaborated:

... it was a five- or ten-year program called the EMP – environmental monitoring program – for Sydney’s ocean outfalls and it demonstrates that there was not a significant concern. We want to ensure we have the upgrade programs progressed on a priority basis where there are issues of greater concern. Our emphasis has been on ensuring that we had upgrade of sewerage treatment plants for the Hawkesbury-Nepean, the mountains and some of those much more sensitive areas.<sup>341</sup>

- 6.10** However, the Committee notes that some concerns were expressed during the inquiry that despite the safeguards outlined above, significant amounts of trade waste are still being introduced into the marine environment. For example, Dr Stuart Khan, Research Fellow at the Centre for Water and Waste Technology at the University of New South Wales said:

Just last year those three major treatment plants – North Head, Bondi and Malabar – discharged 2,500 tonnes of phosphorus and 13 tonnes of nitrogen into the Pacific Ocean. Most of that nitrogen was in the form of ammonia, which is a highly toxic chemical to many marine organisms. That was about nine tonnes of ammonia.<sup>342</sup>

- 6.11** Sydney Water’s licence requires it to monitor the ocean environment in the vicinity of the deepwater ocean outfalls, however current monitoring has not indicated that environmental damage is occurring. In response to a question on notice, Sydney Water advised that the results of its environmental tests indicated that ‘toxicity licence limits have not been breached’:

... whilst discharges of various chemicals to the environment can be quantified from a load perspective, the environmental monitoring via toxicity testing and sediment analysis indicates no demonstrable adverse effects attributable to the deep ocean outfalls.<sup>343</sup>

- 6.12** The Committee also notes the evidence of Mr Evans that Sydney Water is concentrating its efforts on improving the quality of discharge from treatment plants in Western Sydney that feed into the Hawkesbury-Nepean system, rather than the eastern-flowing ocean outfall system:

The Sydney system comprises two categories of plants. There are plants that service the non-coastal areas, which as I said earlier have very high levels of treatment because of the sensitivity of the receiving environment. We are planning for all the available effluent from those Western Sydney plants to be part of some form of recycling. The eastern-flowing systems – the established ocean outfall systems – are differently configured for historical reasons and also because of the relatively greater capacity of the Pacific Ocean to absorb waste flow compared with the Hawkesbury-Nepean system. Therefore, our recycling focus will be on those western areas where there is

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<sup>340</sup> Ms Corbyn, Evidence, 23 March 2006, p30

<sup>341</sup> Ms Corbyn, Evidence, 23 March, p30

<sup>342</sup> Dr Khan, Evidence, 20 March 2006, p11

<sup>343</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Evans, Question 16 (p9 of transcript), p19

the advantage of a more highly treated effluent. We would not expect the outfall volumes to change materially, but we would be looking to recycle all the western stuff.<sup>344</sup>

### Committee comment

- 6.13** The Committee understands that Sydney Water has developed a trade waste policy and acceptance standards which provide strategies for controlling the amount and concentration of trade waste discharged into the sewerage system. The Committee notes that the removal of trade waste from the sewage system requires a relatively high level of treatment of that water in order to bring it up to standard for recycling and agricultural purposes.
- 6.14** The Committee notes that a number of initiatives are under way in western Sydney to recycle and reuse water from sewerage plants that service the non-coastal areas. However, discharge from the eastern-flowing ocean outfall system is likely to have high levels of nitrogen, phosphorous and other harmful chemicals.
- 6.15** The Committee recognises that Sydney Water is rightly concentrating its recycling effort on Western Sydney, where there is greater capacity for recycling water for irrigation and other agricultural purposes and less capacity for the Hawkesbury River to absorb effluent. However, in the long-term, the Committee believes that Sydney Water should look to decrease the amount of effluent being discharged through Sydney's current system of ocean outfalls, while at the same time bringing the level of treatment of that effluent up to a higher level than the current standard with the aim of further reducing the toxic and chemical plumes in the receiving ocean environment.

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<sup>344</sup> Mr Evans, Evidence, 23 March, p13

## Chapter 7      **The ecological health of the Hawkesbury-Nepean and Shoalhaven Rivers**

This chapter examines the ecological health of the Hawkesbury-Nepean and Shoalhaven Rivers. In particular, it examines the impact on both rivers of damming and the extraction of significant amounts of water to supply the population of Sydney. The extraction of water from both systems has limited natural flows of water to both rivers. In part, natural flows can be mimicked by releasing water, in the appropriate amount and at the appropriate time, from dams – these are termed environmental flows. However, the recent drought has limited environmental flow releases to both the Hawkesbury-Nepean and Shoalhaven Rivers, with significant adverse environmental consequences.

### **The health of the Hawkesbury-Nepean and Shoalhaven Rivers**

#### **The Hawkesbury-Nepean River**

- 7.1 During the inquiry, the Committee heard from representatives of the Hawkesbury-Nepean Catchment Authority on the current poor health of the Hawkesbury-Nepean River.<sup>345</sup>
- 7.2 The Authority submitted that Australian rivers operate best when flows are variable, reflecting the seasonal pattern of rainfall and temperature. In these conditions, native animals and plants within the waterway can thrive.
- 7.3 However, the Authority argued that the large number of dams and weirs in the Hawkesbury-Nepean mean that there is very little variable flow in the Hawkesbury-Nepean River below these structures.
- 7.4 The Authority also argued that the river is being affected by the quantity of water that is being extracted to supply water to Sydney. In some parts of the Hawkesbury-Nepean River, the only water available to the river is discharged from sewage treatment works. These discharges exacerbate ecological problems:
- First, they are constant flows so they act contrary to the variability of natural seasonal flows in the river.
  - Second, they carry nutrients such as nitrogen. Most of the nutrient overload in the river can be sourced to sewage works, although there are also stormwater discharges from the older urban areas that contain nutrients. The hydraulic processes operating in the estuary and the lower river cause the nutrient-laden waters to build up above the intertidal zone. As a result, many, but not all, of the river's health problems appear in this reach.
- 7.5 Based on this evidence, the Hawkesbury-Nepean Catchment Authority submitted that many of the waterways within the Hawkesbury-Nepean catchment are in very poor condition through weed infestation, algal contamination, low flows and polluted discharges. This in turn has a deleterious effect on the social, cultural and economic well-being of the river-dependent

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<sup>345</sup> Submission 136, Hawkesbury-Nepean Catchment Authority, pp3-5

communities: 'Fish stocks are down, the estuarine oysters are diseased, prawn stocks have reduced, and natural plants in the river have been overwhelmed by exotic pest species'.<sup>346</sup>

- 7.6 The Committee also heard evidence from Professor Charles Essery, an independent water consultant, who resides in Brooklyn:

I live in Brooklyn, which I suppose is the last point on the river, where the oyster farms used to be. In February last year the oyster farms were closed down because of the QX virus. That is a parasite that lives in the oysters; it is not something that was introduced to those oysters. It is in every oyster in Australia, but particularly rock oysters. I would suggest that most biologists are looking at a cause based on some pathological thing that is killing off these oysters. I would suggest it is the lack of flows coming down that river. I am told that the people in the Shoalhaven are now having some problems with their oysters, which are becoming more stressed. So it is very important that we have those flood flows coming down. The reason that the Hawkesbury-Nepean is there is the several centuries of large flood flows of that sort coming down and at the moment it is actually starved of those. So it is probably having a range of different impacts that we have not even bothered to detect yet.<sup>347</sup>

- 7.7 The Committee notes that the current drought has further constrained natural flows of water to the Hawkesbury-Nepean River, while also preventing water stored in the dams on the river from being released to the river as environmental flows.

### **The Shoalhaven**

- 7.8 Since 1976, the Shoalhaven River has been an integral part of Sydney's water supply, being used on three separate occasions during periods of drought to bolster Sydney's dam levels. Under the scheme, water is pumped from Tallowa Dam (at the junction of the Kangaroo and Shoalhaven Rivers) through a series of pipelines and reservoirs to either the Nepean or Warragamba Dams.
- 7.9 In the present drought, pumping began when the Sydney storage levels fell to approximately 60% in 2003. Since then, approximately 25% of Sydney's supply has since been sourced from the Shoalhaven River.
- 7.10 The Shoalhaven Scheme operates as a drought reserve supply. It is activated when the total storage level of all the dams in the Sydney system falls below 60%. As part of its normal drought management response, Sydney has transferred a total of 939 gigalitres of water from the Shoalhaven River since 1980 as follows:
- August 1980 – November 1984: 430GL
  - June 1994 – May 1995: 140GL
  - April 2003 – March 2006: 397 GL
- 7.11 The transfers represent just over 3% of the total Shoalhaven River flow for this period. Since April 2003, the current drought has required pumping from the Shoalhaven River when

<sup>346</sup> Submission 136, Hawkesbury-Nepean Catchment Authority, p5

<sup>347</sup> Professor Essery, Evidence, 10 March 2006, p15

sufficient inflows occur. From April 2003 – March 2006, the Sydney Catchment Authority has transferred more than 397 gigalitres of water to Sydney's water supply dams from Tallowa Dam. This has contributed approximately 25% of Sydney's water supply over this time.<sup>348</sup>

**7.12** The Chair of the Shoalhaven River Alliance, Mr Terry Barratt, argued during hearings that the current water extractions from the Shoalhaven, allowed once Sydney's supply system drops below 60%, are having a significant adverse impact on the river and communities that live along the river:

The financial impacts on oyster farmers, professional fishers and the tourism industry of these inadequate flows in the river are due to the extractions, the current rate of the extractions. Recreational fishing resources are depleted and are having an impact on people who fish in the river. Canoeists, bushwalkers, water-skiers and swimmers are all suffering. Water-skiers and swimmers, body contact recreational sports I have referred to. Summer of last year you could not swim in the river. People suffered tremendous impacts from other jellyfish infestations – huge intense numbers.<sup>349</sup>

**7.13** Mr Robert Thorne, a member of the Shoalhaven River Alliance, also raised the ecological health of the Shoalhaven estuary. The Shoalhaven estuary extends for 50 kilometres from the end of the river tract at Burrier to the ocean at Crookhaven Heads. The estuary is dominated by tidal fluctuations that play an important part in the interaction of salt and fresh water within the estuary.

**7.14** Mr Thorne argued that between May 2003 and July 2005, the withdrawal of massive amounts of water from the Shoalhaven has prevented any water from flowing over the Tallowa Dam wall. The only water released to the river has been the daily environmental flow of 90 megalitres.

**7.15** As a result, Mr Thorne argued that for more than two years the entire Shoalhaven estuary was subjected to unnatural prolonged high salinities which approached those of the worst drought levels. Mr Thorne told the Committee that in the two years following commencement of pumping by the Sydney Catchment Authority (SCA) in 2003, the episodes of high salinity levels in the river (30-35 parts per thousand) approximately doubled relative to the preceding years.<sup>350</sup>

**7.16** During this period between May 2003 and July 2005, good coastal rainfalls that caused river flows into Tallowa Dam that would have reduced estuary salinity were diverted. The few very brief reductions in estuary salinity that did occur during this period were the result of inflows to the river from tributaries below Tallowa Dam, principally from Yalwal Creek.

**7.17** Mr Thorne submitted that the impacts of the prolonged high estuary salinity have included widespread death of the Phragmites reed, which fringes the estuary and provides habitat for juvenile fish and other species; decimation of prawn stocks and adverse affects on the oyster

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<sup>348</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p84 and <[www.sca.nw.gov.au/dams/faqshoal.html](http://www.sca.nw.gov.au/dams/faqshoal.html)>

<sup>349</sup> Mr Barratt, Evidence, 23 March 2006, p50. Mr Barratt told the Committee that the jellyfish infestation reached as far as twenty kilometres up the river; Evidence, 23 March 2006, p51

<sup>350</sup> Submission 135, Mr Thorne, p5

industry; and invasion of marine species into the estuary, including undesirable species such as jellyfish and blue ringed octopuses.

- 7.18** Accordingly, Mr Thorne argued that the current environmental flow allowance of 90 megalitres a day to the Shoalhaven estuary is insufficient:

It is clear that the so-called environmental flow of 90 megalitres a day imposes on the estuary a salinity regime that is effectively that of a drought. It fails totally to reflect the physical environment in the estuary at which the web of life is dependent.<sup>351</sup>

- 7.19** The Committee notes that these comments from members of the community reflect the strong community interest in ensuring the health of the lower Shoalhaven River. It notes that a wide range of scientific studies are currently being undertaken to increase understanding of the effects of releases from Tallowa Dam on the physical and ecological attributes of the lower Shoalhaven, and how these are likely to change in response to a different regime of river flows. These scientific studies, together with findings of past investigations, will be considered by technical experts to determine the most effective regime of environmental releases from Tallowa Dam for the benefit of the river.

- 7.20** The Committee notes that consultation on a new environmental flow regime for the lower Shoalhaven River is taking place through the Shoalhaven Community Reference Group. This Group includes representatives of the Southern Rivers Catchment Management Authority, Shoalhaven City Council and local indigenous, community, tourism, fishing and environment organisations. The Committee understands that the Government intends to release a discussion paper on the Shoalhaven Scheme in mid-2006 which will include options for the future environmental flows regime for Tallowa Dam.<sup>352</sup>

## **The Metropolitan Water Plan 2004**

- 7.21** The Government's approach to dealing with the issue of sustaining river health, including managing the ecological health of the Hawkesbury-Nepean and Shoalhaven Rivers, is outlined in its Metropolitan Water Plans.
- 7.22** The Metropolitan Water Plan 2004 noted that the rivers supplying Sydney have been dammed to provide the population of Sydney with drinking water and that this has had unavoidable ecological affects. The plan went on to note that a key factor in ensuring the health of a river and the living things that depend on it is the volume, quality, timing and pattern of water flowing down it.
- 7.23** Accordingly, the Metropolitan Water Plan 2004 articulated the need for new environmental flow regimes for the Hawkesbury-Nepean and Shoalhaven Rivers, to be implemented by 2015. The plan outlined the capital works that would be undertaken and the timing of increases to the then current interim environmental flow arrangements.<sup>353</sup>

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<sup>351</sup> Mr Thorne, Evidence, 23 March 2006, p54s

<sup>352</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p105

<sup>353</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p21

- 7.24 However, the Committee notes that the Metropolitan Water Plan carried the caveat that the increase or even maintenance of environmental flows would depend upon there being 'sufficient water to support both the needs of the population and the rivers'.<sup>354</sup>

### **The Sydney Metropolitan Water Sharing Plan**

- 7.25 In the Metropolitan Water Plan 2004, the Government indicated that it would develop a Sydney Metropolitan Water Sharing Plan under the *Water Management Act 2000*, to identify the total amount of water available in the system, including the Hawkesbury-Nepean and Shoalhaven Rivers. Based on this analysis, the plan will allocate water for:

- environmental flows
- consumption by Sydney's residents and businesses
- irrigators.

- 7.26 The plan is to include benchmarks that will indicate how much water Sydney residents, businesses and irrigators can sustainably use within the life of the plan.

- 7.27 The Metropolitan Water Plan 2004 indicated that the Water Sharing Plan would be based on the results of the community consultations undertaken by the Hawkesbury-Nepean River Management Forum. The relevant Catchment Management Authorities will also assist through targeted community discussions.<sup>355</sup>

### **The February 2006 Progress Report**

- 7.28 The Government updated the Metropolitan Water Plan 2004 in February 2006 with the release of its Progress Report. The report did not provide any additional information on the timeframe for the development of the environmental flow package as outlined in the 2004 Water Plan. However, it did announce a number of plans for the future management of water resources in the Hawkesbury-Nepean and Shoalhaven systems. These are discussed below.

## **Current issues facing the Hawkesbury-Nepean River**

### **Environmental flows to the Hawkesbury-Nepean River**

- 7.29 As indicated, the Metropolitan Water Plan 2004 specified that by 2015, the Government would have the information needed to determine the environmental flows to be provided to the Hawkesbury-Nepean River from Warragamba Dam and other dams in the Hawkesbury-Nepean catchment.

- 7.30 However, the Committee notes that at its first public hearing on 10 March 2006, Professor Essery expressed his view that there was no need to wait until 2015 to decide the

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<sup>354</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, pp20-21

<sup>355</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p25

appropriate environmental flow package for the Hawkesbury-Nepean River.<sup>356</sup> Professor Essery referred to the 2003 Hawkesbury-Nepean Forum Report which, he noted, had identified a need for an environmental flow of 100 gigalitres a year. Professor Essery argued that this water should be found now and if potable water from the dams was not available then it should be substituted with appropriately treated water.<sup>357</sup>

- 7.31** The Committee notes that the February 2006 Progress Report did not update the provisions of the Metropolitan Water Plan 2004 in relation to determining environmental flows for the Hawkesbury-Nepean.

### **The Western Sydney Recycled Water Initiative**

- 7.32** While the February 2006 Progress Report did not update the provisions of the Metropolitan Water Plan 2004 in relation to determining environmental flows for the Hawkesbury-Nepean, it did announce a major recycling initiative in North Western Sydney – the Western Sydney Recycled Water Initiative – that will have a direct positive impact on the Hawkesbury-Nepean River.
- 7.33** The key feature of the Western Sydney Recycled Water Initiative is the construction of an advanced water treatment plant sourcing water from three existing sewage treatment plants at St Marys, Penrith and Quakers Hill. Treated water from the new plant will service demand for recycled water from new residential land releases and also being returned to the Hawkesbury-Nepean to replace water currently released from Warragamba Dam for agricultural, domestic, stock and river health purposes.<sup>358</sup>
- 7.34** Most importantly, the scheme will see the removal of large quantities of algae-causing nutrients currently being discharged by the existing sewage treatment plants into the river. This should deliver significant water quality improvements to the Hawkesbury-Nepean. The Progress Report went on to note that over the next 25 years the Government is committed to substituting as much recycled water as feasible for planned environmental releases from Warragamba Dam.
- 7.35** The expected completion date for the new water treatment plant is 2009. The plans is expected to produce 21 gigalitres of recycled water by 2011, rising to 27 gigalitres a year by 2015.
- 7.36** In evidence, Mr David Evans, Managing Director of Sydney Water, advised that the Western Sydney Recycled Water Initiative was on track:

The last and biggest of them is a program we discussed briefly yesterday: to take effluent from the existing highly-treated western sewage treatment plants and treat it still further and change the point at which it is disposed into the river system such that we will improve the health of the river and it will allow us to hold additional water behind Warragamba Dam, which is presently released into the river. That is a very

<sup>356</sup> Professor Essery, Evidence, 10 March 2006, p18

<sup>357</sup> Professor Essery, Evidence, 10 March 2006, p17

<sup>358</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p6

innovative and complex scheme but we are of the view that that can be implemented and completed by 2009.<sup>359</sup>

**7.37** As indicated, a key feature of the Western Sydney Recycling Initiative is the provision of recycled water via dual reticulation to all new homes to be built in new suburbs in Sydney's north west and south west. Mr Robert Wilson, a member of the Hawkesbury-Nepean Catchment Authority Board, supported the initiative on the basis that it diverts sewage from being discharged into the river.

**7.38** However, the Committee notes that the Western Sydney Recycled Water Initiative will not by itself resolve the issue of inadequate environmental flows for the Hawkesbury-Nepean. Mr Peter Prineas, Member of the Executive of the Nature Conservation Council of New South Wales, put the issue in perspective:

The NCC is very pleased to support the Government's Western Sydney recycled water initiative, even though it is a non-potable response. It promises to deliver non-potable water for industrial and agricultural purposes and for environmental flows to the Hawkesbury-Nepean and Nepean. We also note with some approval that the water is to be stripped of the nutrients which currently contribute to the severe algal bloom problems in the river. Nevertheless we note that the environmental flow requirements for the river are three or four times the output of the new scheme and the river could continue in its currently stressed condition for years. So although it is a good response, it is not enough.<sup>360</sup>

#### **Use of wetlands to remove nutrients**

**7.39** During the inquiry, concerns were also raised whether the new water treatment plant constructed as part of the Western Sydney Recycled Water Initiative would be able to remove nutrients from the water to the level required. It was suggested that wetlands could be used as a further the treatment process. For example, Associate Professor Greg Leslie from the School of Chemical Engineering at the University of New South Wales, stated in evidence:

The issue there is that as good as these treatment processes are, even with biological treatment of the waste water and membrane treatment it is difficult to get the nitrogen levels down to the 0.5 milligram per litre range that they think is required to prevent a lot of the problems in the river. Having a constructed wetland to pass that water through would be a very sensible step rather than trying to find a manmade solution.<sup>361</sup>

**7.40** Associate Professor Leslie also referred to work that had been done in San Diego, California, where a man-made wetland was used to protect a groundwater supply from run-off from large dairy operations.<sup>362</sup>

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<sup>359</sup> Mr Evans, Evidence, 23 March 2006, p6

<sup>360</sup> Mr Prineas, Evidence, 20 March 2006, p19

<sup>361</sup> Associate Professor Leslie, Evidence, 20 March 2006, p9

<sup>362</sup> Associate Professor Leslie, Evidence, 20 March 2006, pp8-9

- 7.41 These wetlands use plants such as duckweed or water hyacinth which consumes all or some of the nutrients in the water. These plants are then harvested and can be used as stock fodder or turned into biodiesel. Associate Professor Leslie was of the view that serious consideration would need to be given to using wetlands if recycled water is to be primarily used to restore environmental flows.<sup>363</sup>
- 7.42 The Committee also heard that Penrith City Council had put forward a proposal to take water from the Penrith sewage treatment plant and then put it through a wetlands and use it to maintain Penrith Lakes.<sup>364</sup>

## Current issues facing the Shoalhaven River

### A water sharing plan for the Shoalhaven

- 7.43 The Metropolitan Water Plan 2004 foreshadowed substantial increases in the amount of water to be transferred from the Shoalhaven to supply Sydney. The plan noted that the options being considered could, on construction of the required infrastructure, provide between 50 and 80 gigalitres of water for Sydney by 2010 and up to 110 gigalitres by 2020.<sup>365</sup> This new infrastructure included raising the height of the Tallowa Dam wall.
- 7.44 However, in the February 2006 Progress Report, the Government dropped the option of raising the Tallowa Dam wall and indicated that it had decided not to proceed with any immediate and significant modification to the current water transfer scheme.<sup>366</sup>
- 7.45 The Report went on to advise that a new environmental flow regime would be put in place to protect the health of the Shoalhaven. The current process of scientific and socio-economic studies and consultation (including with the relevant Catchment Management Authorities) would continue with a view to having a recommended regime ready for Government consideration at the end of the year.<sup>367</sup>
- 7.46 Following the release of the February 2006 Progress Report, on 10 February 2006, the SCA postponed its community feedback sessions on the proposal to raise the Tallowa Dam, since it was no longer on the agenda. In a media release the SCA announced that it would shortly provide updates to the community about the consultation process that would take place with respect to any changes to the issue of water transfers from the Shoalhaven.<sup>368</sup>

<sup>363</sup> Associate Professor Leslie, Evidence, 20 March 2006, p8

<sup>364</sup> Mr Wilson, Evidence, 20 March 2006, p39

<sup>365</sup> NSW Government, *2004 Metropolitan Water Plan*, October 2004, p9

<sup>366</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p10

<sup>367</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p11

<sup>368</sup> Sydney Catchment Authority, 'Urgent – Shoalhaven Community Consultation Sessions now postponed', *Media Release*, 10 February 2006

7.47 In evidence, Mr Barratt argued that the proposal to increase the volume of transfers from the Shoalhaven, as originally foreshadowed in the Metropolitan Water Plan 2004, was developed in a technology and community consultation vacuum.<sup>369</sup> In turn, he strongly advocated the development of a water-sharing plan for the Shoalhaven, to determine the appropriate environmental flows for the river.<sup>370</sup>

### **Greater extractions from the Shoalhaven**

7.48 The Committee notes that while the foreshadowed substantial increases in the amount of water to be transferred from the Shoalhaven are not proceeding at the current time, the February 2006 Progress Report did indicate that the SCA would nevertheless examine the potential for increases in the extraction of water from the Shoalhaven through changed pumping rules and minor modifications to the existing transfer network.

7.49 In his evidence to the Committee, Mr Graeme Head, Chief Executive Officer of the Sydney Catchment Authority (SCA), indicated:

As the progress report indicates, the SCA is currently investigating options for modest increases to Shoalhaven transfers that do not involve the raising of Tallowa Dam wall. We are currently developing an options analysis on that. There are a whole host of issues to do with different yields from different operating rules for the system but also an examination of any local impacts that result from that scheme.<sup>371</sup>

7.50 The Committee notes, however, that the modest increases referred to equate to up to 30 gigalitres a year of additional water from the Shoalhaven.<sup>372</sup>

7.51 In evidence to the Committee, Mr Barratt argued that the Shoalhaven River cannot be used to sustain the growth of Sydney's population. He suggested that relying on the waters of the Shoalhaven was unjust when Sydney was dumping in excess of 400 gigalitres of treatable water in the ocean each year.<sup>373</sup>

7.52 The Committee notes that the SCA will release a discussion paper for community comment in mid-2006 which will examine options for changes to the Shoalhaven transfer system to balance Sydney's water needs against the health of the lower Shoalhaven river.<sup>374</sup>

### **Greenhouse gas emissions due to transfers from the Shoalhaven**

7.53 The transferring significant volumes of water from the Shoalhaven to either the Nepean or Warragamba Dams entails significant energy costs and in turn greenhouse gas emissions.

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<sup>369</sup> Mr Barratt, Evidence, 23 March 2006, p50.

<sup>370</sup> Mr Barratt, Evidence, 23 March 2006, p52

<sup>371</sup> Mr Head, Evidence, 23 March 2006, p4

<sup>372</sup> NSW Government, *February 2006 Progress Report: Securing Sydney's Water Supply, Metropolitan Water Plan*, 8 February 2006, p11

<sup>373</sup> Mr Barratt, Evidence, 23 March 2006, p50

<sup>374</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p85

**7.54** In the 2000-2001 year, the SCA used about 5 gigawatt hours of electricity in pumping water from the Shoalhaven. In the 2002-2003 year, this increased to about 60 gigawatt hours and in the 2003-2004 year this increased to about 223 gigawatt hours.<sup>375</sup>

**7.55** In evidence to the Committee, Mr Head indicated that pumping water from the Shoalhaven is the most energy demanding activity undertaken by the SCA:

Clearly when we are not pumping from the Shoalhaven one of the significant features of the Sydney system is that it is a largely gravity fed system. The intra-basin movements of water from Tallowa Dam up to Fitzroy Falls reservoir require the significant lift and then there is a more modest rise to be gotten over in transferring the water into the catchment.<sup>376</sup>

**7.56** In turn, the substantial electricity demands to pump from the Shoalhaven since 2002-2003 have entailed substantial increase in greenhouse gas emissions, up from about 5,500 tonnes in 2001 to just under 215,000 tonnes in 2003-2004. Mr Head agreed that clearly one of the issues in looking at the Shoalhaven for water supply are greenhouse gas emissions:

... as I mentioned before, we are developing in accordance with the announcement that was made in the progress report a paper identifying the issues associated with different uses of the Shoalhaven. Greenhouse issues will clearly be a set of issues that will need to be considered in that paper, along with discussion of possible offsets for different ranges of greenhouse impacts depending on different modes of operating the scheme.<sup>377</sup>

**7.57** Mr Head did note that when water is transferred from the Shoalhaven the scheme is also used to generate hydroelectricity. However, the information provided to the Committee showed that the hydroelectricity produced by the Shoalhaven did not appear to increase as a result of greater transfers to the Sydney supply system. While the system produced about 60 gigawatt hours in 2001-02, this fell to 46 gigawatt hours in 2002-2003 and then fell again to about 6 gigawatt hours in 2003-2004.<sup>378</sup>

**7.58** The Committee notes that the energy requirements and resultant greenhouse gas emissions, associated with the Shoalhaven transfer scheme in the 2003-2004 year are very similar to those that would be associated with a 125ML/day desalination plant. As indicated earlier in this report, high energy costs and greenhouse gas emission was one of the issues that galvanised opposition to the proposed desalination plant.

## The Metropolitan Water Plan 2006

**7.59** As indicated previously, the Government released the Metropolitan Water Plan 2006 on 8 May 2006. The Metropolitan Water Plan 2006 included reference to a number of initiatives

<sup>375</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Graeme Head, Chief Executive, Sydney Catchment Authority, Question 1, Attachment 1

<sup>376</sup> Mr Head, Evidence, 23 March 2006, pp16-17

<sup>377</sup> Mr Head, Evidence, 23 March 2006, p17

<sup>378</sup> Answers to questions on notice taken during evidence 23 March 2006, Mr Head, Question 1, Attachment 1

in relation to the management of ecological health of the Hawkesbury-Nepean and Shoalhaven Rivers. In relation to the Hawkesbury-Nepean River, the Plan noted:

- The Western Sydney Recycled Water Initiative is likely to reduce sewage treatment plant discharges of algae-causing nutrients to the Hawkesbury-Nepean River. In addition, a new plan for managing nutrient inputs to the lower Hawkesbury-Nepean River from wastewater, stormwater and agricultural run-off will be developed by the Department of Environment and Conservation as a paper for discussion with stakeholders.<sup>379</sup>
- Avon Dam will be altered to allow the release of environmental flows into the Hawkesbury-Nepean in line with the Government's 2004 commitment to a new environmental flow regime for the Hawkesbury-Nepean.<sup>380</sup>
- A final regime of environmental flow releases from Warragamba Dam will not be formally set until 2015, but increases to interim environmental flows will be considered for the period starting 2009, provided sufficient water is available.<sup>381</sup>

**7.60** In relation to the Shoalhaven River, the plan noted:

- Consultation on a new environmental flow regime for the lower Shoalhaven River is continuing through the Shoalhaven Community Reference Group, with a view to having a recommended regime for consideration by the end of 2006.<sup>382</sup>
- The SCA has installed an aeration system at the Tallowa Dam to improve the quality of water released by increasing the levels of dissolved oxygen in the water.<sup>383</sup>

**7.61** The Metropolitan Water Plan 2006 also indicates that the draft water sharing plan for the Sydney Region will be completed and publicly exhibited. There is no timetable set.<sup>384</sup>

## Is enough being done?

**7.62** In Chapters Four and Five, the Committee examined the advances being made with respect to both increasing Sydney's supply of and decreasing Sydney's demand for water. It was noted that while Sydney Water and the Government must be congratulated for the initiatives they have recently implemented and announced, much more is still required.

**7.63** The ecological impact of impeding the natural flow of rivers, through the constructions of dams has been acknowledged for some time and has seen a shift in the traditional approach to securing water supplies. According to Professor Nicholas Ashbolt, Head of School of Civil and Environmental Engineering at the University of New South Wales:

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<sup>379</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p100

<sup>380</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p103

<sup>381</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p104

<sup>382</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p105

<sup>383</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p105

<sup>384</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p108

Welcome Reef was planned back in 1968, with the land purchases there. Now we have finally decided we will not build that, for the simple reason of environmental flows. We cannot keep taking more source waters from our rivers; we now realise that; I think there has been an expectation and engineering conscience that that was the way forward in the past: that we could, when needed, just harvest water from the environment. We now realise we are part of the environment, that that really is not a long-term, sustainable solution.<sup>385</sup>

- 7.64** However, the evidence before the Committee is that there remains significant tensions between securing water supplies to Sydney's population, while at the same time maintaining sufficient environmental flows to ensure the ecological health of the region's rivers, notably the Hawkesbury-Nepean and Shoalhaven Rivers. As stated by Mr Leigh Martin, Urban Campaigner from the Total Environment Centre in evidence:

We need to recognise that we have extremely limited resources in terms of freshwater reserves and that as we move into a potentially drier climate, with global warming and a growing population, those challenges will increase. The current water shortage problem Sydney has should not by any means be viewed as simply a function of the current drought. It is clear that we have a long-term sustainability challenge. It is important to note that sustainable yield of the current supplies is 600 gegalitres per annum. Before water restrictions demand was running in the vicinity of 630 gegalitres per annum. That indicates that there is an underlying level of unsustainable demand for current water resources.

It is also important to bear in mind that that 600 gegalitre figure for sustainable yield does not include any allowance for environmental flows for the Hawkesbury-Nepean system, which it is well established is a system in severe stress and in need of an environmental flows package.

The expert panel that examined environmental flows for the Hawkesbury-Nepean concluded that a volume of water of around 100 gegalitres a year would be required for an effective environmental flows package. From current resources, the true environmentally sustainable yield is a figure close to 500 gegalitres a year and that indicates the significant nature of the challenge we have.<sup>386</sup>

## Committee comment

### *The water sharing plan*

- 7.65** The Committee notes that the 2006 Metropolitan Water Plan, like the 2004 plan, foreshadows the development and implementation of a water sharing plan for the Sydney region. The plan is expected to allocate water sharing arrangements balancing consumption by Sydney's residents and businesses, irrigators with the use of water for environmental flows.
- 7.66** In the Committee's opinion, the finalisation of the water sharing plan, including the consultation process on the allocation of sufficient environmental flows to the Hawkesbury-Nepean and Shoalhaven Rivers, is imperative. The plan is necessary if the Government is to

<sup>385</sup> Professor Ashbolt, Evidence, 20 March 2006, p29

<sup>386</sup> Mr Martin, Evidence, 10 March 2006, p40

make progress in restoring adequate environmental flows to both the Hawkesbury-Nepean and Shoalhaven Rivers.

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**Recommendation 16**

That the Department of Natural Resources, as a matter of urgency, finalise the water sharing plan for the Sydney region, including allocations of environmental flows to the Hawkesbury-Nepean and Shoalhaven Rivers.

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***The Hawkesbury-Nepean River***

- 7.67** The Committee notes evidence that the Hawkesbury-Nepean River faces significant ecological challenges as a result of damming and the extraction of significant amounts of water to supply the population of Sydney. The lack of natural or environmental flows to the river, especially during the current drought, are leading to significant problems such as weed infestation, algal contamination, low flows and polluted discharges.
- 7.68** Accordingly, the Committee applauds the Western Sydney Recycled Water Initiative and notes that it has been generally well received by participants to the inquiry. The notion of treating wastewater to an appropriate standard and using it to replace potable water from Warragamba Dam currently released for environmental flows is attractive in its simplicity.
- 7.69** At this stage the Committee is not in a position to comment whether the construction of wetlands is necessary for the extraction of additional nutrients from recycled water produced as part of the Western Sydney Recycled Water Initiative. However, it does believe that it is an issue that Sydney Water needs to consider.
- 7.70** However, the Committee recognises that the Western Sydney recycling initiative will not by itself resolve the issue of inadequate environmental flows to the Hawkesbury-Nepean. The Committee accepts estimates that environmental flows of 100 gegalitres a year would be required to restore the ecological health of the river. From current resources, such flows are simply not available. At present, adequate environmental releases of water to the Hawkesbury-Nepean are being sacrificed in order to ensure a base level of supply to Sydney.
- 7.71** The Committee notes that the Metropolitan Water Plan 2004 included a new environmental flow regime for the Hawkesbury-Nepean Rivers, to be implemented by 2015. The Committee believes it should be implemented sooner, in line with a finalised water sharing plan for the Sydney region.

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**Recommendation 17**

That the Department of Natural Resources ensure that adequate environmental flows are restored to the Hawkesbury-Nepean River, in line with a finalised water sharing plan for the Sydney region.

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*The Shoalhaven River*

- 7.72 Similar to the Hawkesbury-Nepean River, the Committee notes the views of community members that the Shoalhaven River faces significant ecological challenges as a result of damming and the extraction of water from the system. In particular, the Committee notes the evidence on the impact of prolonged high salinity on the Shoalhaven estuary.
- 7.73 While the Committee welcomes the Government's moves in the 2006 Progress Report away from substantial increases in the amount of water to be transferred from the Shoalhaven to supply Sydney and away from increasing the height of the Tallowa Dam wall, the Committee notes that the Government is still looking to extract up to 30 gegalitres a year of additional water from the Shoalhaven in the future.
- 7.74 The Committee believes that the extraction of any additional water from Tallowa Dam should be based on peer reviewed scientific studies and not cause significant ecological harm to the lower Shoalhaven River.
- 7.75 Once again, the Committee strongly supports the urgent implementation of a water sharing plan for Sydney, including allocations of adequate environmental flows for the Shoalhaven.

**Recommendation 18**

That the Department of Natural Resources ensure that adequate environmental flows are restored to the Shoalhaven River, in line with a finalised water sharing plan for the Sydney region.

- 7.76 On a related matter, the Committee finds it ironic that the current practice of transferring water from the Shoalhaven to supply water to Sydney, which in effect helps forestall the drop in Sydney's dam levels that would trigger construction of a desalination plant, is itself a major contributor to greenhouse gas emissions.
- 7.77 The Committee notes that the Government committed to installing renewable energy resources to match the amount of electricity that would be used by the proposed desalination plant. The Committee believes that the Government should undertake a cost/benefit analysis of installing renewable energy resources to match the amount of electricity used to transfer water from the Shoalhaven to the Nepean and Warragamba Dams.

**Recommendation 19**

That the Government undertake a cost/benefit analysis of installing renewable energy resources to match the amount of electricity used to transfer water from the Shoalhaven to the Nepean and Warragamba Dams.

## Chapter 8 The future of water management in Sydney

Throughout the inquiry, it was agreed by all participants that there is no one single solution that can provide a sustainable water supply for Sydney, but that a suite of both supply and demand options is required. The crux lies in determining what is the best mix of options to pursue. Many witnesses agreed that the best mix of options cannot happen by chance but will be the result of strategic planning and assessment.

### An integrated water management plan for Sydney?

- 8.1** During the inquiry, a number of witnesses emphasised to the Committee the importance of an integrated water management plan for Sydney for the next 20 or 50 years to coordinate the variety of strategies that affect Sydney's water supply and demand. For example, Professor Nicholas Ashbolt, Head of School of Civil and Environmental Engineering at the University of New South Wales, told the Committee:

How do we go about determining what is a sustainable solution to Sydney's water services? I use the term "water services" deliberately, because it is not just drinking water. If we provide drinking water, we produce wastewater. We need to be looking at it holistically.<sup>387</sup>

- 8.2** Councillor Kenneth McDonell, Executive Member of the Local Government and Shires Association of New South Wales, also supported the need for an integrated management system, to ensure Sydney is in a position in which 'we are as drought-proof as possible'.<sup>388</sup>

### Cost benefit analysis of water management proposals for Sydney

- 8.3** Cost benefit analysis is designed to take into account the full economic, environmental and social impacts, both positive and negative, of an option or proposal – in other words, the triple bottom line. Traditionally, many planning decisions have tended to focus on only the economic costs and benefits of a proposal.
- 8.4** During the inquiry, a number of parties to the inquiry highlighted the need for full cost benefit analysis of the triple bottom line of water management proposals for Sydney as part of a broader water management plan for Sydney.
- 8.5** For example, the Local Government and Shires Association highlighted the need for cost benefit analysis in their submission and also in evidence. Councillor McDonell told the Committee:

The LGA supports a range of options to achieve a sustainable water supply for Sydney. We recognise that there is no single best solution. However, like many of our member councils, one of our key concerns had been the lack of analysis of the options for securing Sydney's water supply. There needs to be an adequate analysis of

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<sup>387</sup> Professor Ashbolt, Evidence, 20 March 2006, p28

<sup>388</sup> Clr McDonell, Evidence, March 10 2006, p29

alternatives of Sydney's water supply to ensure they are the most socially, economically and environmentally responsible activities to pursue.<sup>389</sup>

- 8.6** Similarly, Dr Stuart Khan from the Centre for Water and Waste Technology at the University of New South Wales advised the Committee that it was important that water management planning for Sydney be based on more than the economic rationale for particular water management proposals:

Economically, nothing is going to stack up with just letting the rain fall, taking all of that water, reusing it once and dumping it out to sea. Even though we have just heard about the high maintenance costs of those outfalls, water reuse always comes up as an economically more expensive approach simply because of the extra treatment that is required and the extra infrastructure. So we need to take into account some of the environmental and social benefits as well, and social costs.<sup>390</sup>

- 8.7** The Committee also heard from Mr David Nemtzw, Director General of the Department of Energy, Utilities and Sustainability, that applications to the Water Savings Fund are measured on a variety of criteria and that, whilst the most important was cost effectiveness, a number of other key considerations are involved. He explained to the Committee:

We want to know how much water we can save through efficiency, stormwater harvesting, reuse, recycling, how much we can save for every dollar of the fund. Other factors are looked at – innovation, market transformation, public education, et cetera – but the cost effectiveness is at the heart of it.<sup>391</sup>

## The need for greater public consultation

- 8.8** In May 2005, the Auditor General released a report entitled *Planning for Sydney's Water Needs* in which it was recommended that the relevant Government departments and agencies, including Sydney Water, engage more fully with the public on the issues facing Sydney in relation to water demand and supply.<sup>392</sup>
- 8.9** Subsequently, in October 2005, the Independent Pricing and Regulatory Tribunal (IPART) released its final report on the *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region*. The IPART reiterated the Auditor General's recommendation, while recognising the commercial-in-confidence limitations on Sydney Water.<sup>393</sup>
- 8.10** A number of parties to the inquiry also noted the benefits of transparency and the open provision of information in seeking to obtain public acceptance of the Government's proposed water management strategies.

<sup>389</sup> Clr McDonnell, Evidence, 10 March 2006, p22

<sup>390</sup> Dr Khan, Evidence, 20 March 2006, p13

<sup>391</sup> Mr Nemtzw, Evidence, 23 March 2006, p15

<sup>392</sup> Sendt RJ, May 2005, *Auditor General's Report Performance Audit: Planning for Sydney's Water Needs*, pp55-56

<sup>393</sup> Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region: Final Report*, October 2005, pp67-68

- 8.11** For example, Mr Ian Kiernan, Executive Chairman of Clean Up Australia Ltd, told the Committee in evidence of his personal commitment to I feel a responsibility to ‘empower[ing] the community towards understanding the water issues that face us’.<sup>394</sup> He argued that consulting and providing publicly available information should be an important part of any water management plan:

We know that Australians are not very keen on being told what to do but we know that they crave information so that they can make their own informed decisions.<sup>395</sup>

- 8.12** Mr Robert Walshe, Convenor of the Combined Community Groups of Sutherland Shire Concerned with Water Saving in Greater Sydney, told the Committee that consultation would stimulate participation by a wide range of community representatives and would decentralise the responsibility for providing water management solutions away from government:

Our shire’s community groups, I might say, initiated the idea that government and Sydney Water could announce a three-month period of public involvement in a water-saving discussion; that is to say, a widespread public forum that would stimulate participation by individuals, clubs, schools, utilities, businesses, big industry – every part of society – with emphasis really on “what can we do?” quite apart from what government is doing, so that there is decentralisation, the very opposite of a centralised mega plant on Kurnell – a locality emphasis and a diffusion of expedients. That is our aim.

...

My belief is that there is tremendous creativity in the community. Give them a chance; start up something that has a little drama to it. I have listened and appreciated the good things that Sydney Water is doing and the campaign, but the campaign has slumped; it needs reviving. I suggest it needs that touch of drama with a three-month Federal campaign, regular reporting and use of the media. I think both sides of politics would applaud such a measure and only good could come of it.<sup>396</sup>

- 8.13** Mr Walshe was subsequently asked what kind of methods he would suggest to the Government to engage both industry and the community in water management issues. He responded that the dissemination of information was the critical element:

Trust your community as long as you can get information out to them, they will give a lot back that is excellent.<sup>397</sup>

- 8.14** In turn, Associate Professor Greg Leslie of the School of Chemical Engineering at the University of New South Wales advised the Committee of the consultative methods used by the Orange County Department of Public Affairs in California.<sup>398</sup> He told the Committee that the Department made over 350 community presentations, targeting core community groups to

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<sup>394</sup> Mr Kiernan, Evidence, 10 March 2006, p2

<sup>395</sup> Mr Kiernan, Evidence, 10 March 2006, p2

<sup>396</sup> Mr Walshe, Evidence, 23 March 2006, p44: 43-44

<sup>397</sup> Mr Walshe, Evidence, 23 March 2006, p47

<sup>398</sup> Associate Professor Leslie was a former employee of the Orange County Department of Public Affairs

address particular concerns. While this method took considerable effort, it was a more successful strategy than a 'blanket approach' because it enabled development of a 'suite of messages' which resonated with different groups.<sup>399</sup>

- 8.15** Finally, the Committee notes that its own inquiry commenced in late December 2005 with a call for submissions, in response to which the Committee received a large number of submissions from members of the community interested in water management strategies and offering a varied range of possible solutions to the provision of a sustainable water supply for Sydney.

### **The transparency of the Sydney Water planning processes**

- 8.16** The Committee notes that at the hearing on 20 March 2006, Professor Ashbolt argued that there is a lack of transparency in the Government's (then current) February 2006 Progress Report:

The plan states clearly that the Government has undertaken detailed planning and it is now going to call for expressions of interest in a proposal that takes some 35 gegalitres from the inland sewage treatment plants to put into the Hawkesbury-Nepean for environmental flows. On what basis was that decision made? Why is that considered a useful step forward in recycling? I get the impression that it is not being looked at holistically. Is that the best way we can spend our money in getting recycling? Is that the most sustainable solution?<sup>400</sup>

- 8.17** Professor Ashbolt subsequently described how the development of the 2006 Progress Report might have been improved through a broad mixture of stakeholder participation and the consideration of a number of key principles:

When we are considering what is sustainable, we need to look across those five basic principles of sustainability: human health, environmental health, the cost – that is the life-cycle cost, not just the current pricing, short-term financial side – the socio-cultural issues – do people want to use these systems, will they use them, what changes are needed – and the technological function.

To me, sustainability is integrating across those five principal aspects.<sup>401</sup>

- 8.18** Professor Ashbolt further argued that, in his opinion, consultation on the various aspects of the Government's February 2006 Progress Report was limited to consultation with government agencies, which did not consider options that were outside their traditional framework:

Again, the generation of options seems to have been done within the bounds of a few government organisations and not in a public way. The missed opportunity here is the lack of diversity of options that would have come forward via a more open process. We have got good instruments here in the form of ... peak environment groups, as

<sup>399</sup> Associate Professor Leslie, Evidence, 20 March 2006, p10

<sup>400</sup> Professor Ashbolt, Evidence, 20 March 2006, p28

<sup>401</sup> Professor Ashbolt, Evidence, 20 March 2006, p29

well as other organisations that can assist in this type of process, but we are not harnessing that energy from our local community.<sup>402</sup>

## Strategies to facilitate better public consultation

- 8.19** During the inquiry, a number of strategies were suggested to the Committee to facilitate better public consultation in planning for a sustainable water supply for Sydney.

### An independent panel

- 8.20** In 2003, the Government established the Expert Water Panel to develop a water balance strategy for Sydney. This panel produced a report entitled *A Sustainable Water Balance for Sydney* which identified the need for an overall water plan for the future. The Committee understands that the report, including its recommendations, has not been publicly released.<sup>403</sup>

- 8.21** Mr Kiernan, a member of the Expert Water Panel, acknowledged in evidence that the NSW Government is taking some action in relation to water planning and the recommendations of the 2003 Expert Water Panel, but told the Committee that more needs to be done:

What that Expert Water Panel report recommends should ensure a balanced sustainable water plan for the next 20 years and that is what we need. This is about developing a blueprint for the future of Sydney Water Corporation. Heavens above, they really need it! Credit where credit is due, the New South Wales Government has enacted some policies and actions that start to address the challenges, but more needs to be done – again, as outlined in that Expert Water Panel report as the blueprint for the future.<sup>404</sup>

- 8.22** Accordingly, Mr Kiernan advocated the appointment of an independent scientific panel, to ensure the dissemination of information and public education:

What I want to recommend is ... the formation of a top-class, independent scientific panel of a brutally practical nature to ensure that the levels of education and practical reform set out in the Expert Water Panel report are actually implemented.<sup>405</sup>

- 8.23** Similarly, Professor Charles Essery, an independent water consultant, suggested the formation of a panel comprised of members with relevant expertise. Professor Essery highlighted the need for such a panel to be independent of government and large corporations:

We need to have some independence in there and you need to get expert advice, not just from Australia but from people overseas. We do not have all the answers. I reiterate what Ian Kiernan said: please get an independent group of people but not a

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<sup>402</sup> Professor Ashbolt, Evidence, 20 March 2006, p30

<sup>403</sup> Mr Kiernan, Evidence, 10 March 2006, p2

<sup>404</sup> Mr Kiernan, Evidence, 10 March 2006, p2

<sup>405</sup> Mr Kiernan, Evidence, 10 March 2006, p3

set of hacks, the same usual suspects who are producing the same usual facts and spin for their organisation that is currently in charge of the metro plan.<sup>406</sup>

- 8.24** Professor Essery argued that the need for independence was a critical one, as the panel needed to inspire a culture of transparency in relation to water management issues:

The only person who seems to be independent in New South Wales is the Auditor-General. IPART is not independent; it has interference from Treasury. Certainly government departments are not independent; they do what they are told. We need to have a body that is depoliticised and looking at the long-term future. It has to be a section of the Auditor-General's office because that is the only office that has the powers under our legislation to be open.<sup>407</sup>

- 8.25** Further, Professor Essery emphasised the need for the panel to be able to provide advice based upon rigorous scientific analysis and consultation. He explained:

Make it a panel of people who can give you proper answers that will give you information to allow someone to make decisions based on facts, not on spin and rhetoric.

...

Get the people of Sydney to tell you how much they are willing to pay for what they have said they want and then go ahead with it. Do what Adelaide, Melbourne and Perth did. They had an open process by which they explained and could justify the information that was being given to people. That is probably the most important thing you have to think of. There is no shortage of water. There is plenty of water but it will cost money.<sup>408</sup>

- 8.26** Finally, Mr Robert Wilson, a member of the Hawkesbury-Nepean Catchment Authority Board, highlighted the role an expert panel could play achieving eventual community acceptance of issues such as potable reuse:

You have to get together a group of scientists, not only health scientists but also social scientists, to think about how you would introduce potable re-use in Sydney and you would let everyone know that you were doing that.<sup>409</sup>

### **Consultation with local government**

- 8.27** Throughout the inquiry, the Committee heard that councils are keen to be involved in water savings initiatives and planning. The Committee also notes that local government has some responsibility in relation to the maintenance of water supply, sewerage and stormwater drainage works and facilities, under the *Local Government Act 1993*.<sup>410</sup>

<sup>406</sup> Professor Essery, Evidence, 10 March 2006, p13

<sup>407</sup> Professor Essery, Evidence, 10 March 2006, p21

<sup>408</sup> Professor Essery, Evidence, 10 March 2006, p13

<sup>409</sup> Mr Wilson, Evidence, 20 March 2006, p42

<sup>410</sup> *Local Government Act 1993*, Division 2, part 56

- 8.28** Councillor Sam Byrne, Mayor of Marrickville Council and representative of the Local Government and Shires Association of New South Wales, emphasised in evidence to the Committee the importance of having local government input into water strategies:

Local government is very much on board with the water issue in Sydney. My feeling from being on the executive of the association is that local government across New South Wales recognises this as a major issue. We are certainly hearing that from the communities as well. Engagement with local government on these issues will be very important. I do not think the committee will find resistance from local government; there is a real interest. A lot of the things we do require water; water plays a big part in a lot of the work we do locally. Consequently, local government across the spectrum sees this as a big priority for Sydney.<sup>411</sup>

- 8.29** The Committee notes the number of innovative water saving initiatives that have been implemented by councils, such as those mentioned in Chapter 5 of this report.

### **The publication of asset management plans**

- 8.30** In his evidence to the Committee, Mr Wilson indicated that in Britain, the various water corporations supply the government with asset management plans, in order to provide a better perspective on the maintenance of water infrastructure for strategic planning.

- 8.31** Mr Wilson argued that the provision of asset management plans could also be used to encourage public acceptance of water reuse and other water saving initiatives here in Sydney:

... you force Sydney Water to start preparing some assets management plans that anticipate where those experimental or pilot works are going, like the Hawkesbury-Nepean, like some of the work that the Government has now announced for around Camellia and Rosehill racecourse, popularise those and you say, "Government is working. Government is going to do better with its schools, putting in rainwater tanks and putting in a whole series of recycling schemes," so that you instil throughout the community an expectation that you can save water and reuse water and that we are no longer going to send anything to sea. I do not think there is yet an expectation in Sydney Water that would take seriously any suggestion that we will stop sending water to sea. So you have to ask Sydney Water for an asset management plan and they will tell you how to do it. They can do it.<sup>412</sup>

### **The Warren Centre project**

- 8.32** In evidence, Mr Donald Hector, Co-Chair of the Metropolitan Water Options Project of the Warren Centre at the University of Sydney,<sup>413</sup> advised the Committee of a project commenced by the Warren Centre to determine a water strategy for Sydney through broad consultation and the consideration of the various elements of the 'water subsystem'.<sup>414</sup>

<sup>411</sup> Clr Byrne, Evidence, 10 March 2006, p25

<sup>412</sup> Mr Wilson, Evidence, 20 March 2006, p42

<sup>413</sup> The objective of the Warren Centre is to foster excellence and innovation in advanced engineering throughout Australia.

<sup>414</sup> Mr Hector, Evidence, 20 March 2006, pp63-64

**8.33** Mr Hector noted that one of the difficulties of designing an integrated water management plan was the complexity of Sydney's water system. He added that one of the key tasks of this project is:

... to characterise the water subsystem, which includes sources, distribution, reuse and eventual recycling of water as an integrated subsystem within the entire social system of the Sydney metropolitan area and the areas impacted by Sydney.<sup>415</sup>

**8.34** Mr Hector also noted the longevity of the project – planning and outcomes were expected to take into account 20 to 50 year time frames. Given those time frames, he highlighted the need for an adaptable management plan that takes into account changes in technology and the social and environmental balance.<sup>416</sup>

### The Government's planning approach

**8.35** In his opening statement to the inquiry, Mr David Evans, Managing Director of Sydney Water, told the Committee that the February 2006 Progress Report reflected:

... a view over 25 years of the right combination of demand management, water savings, recycling, catchment-induced supplies, et cetera – but also increasingly and obviously in the present Australian context where we have had eight or nine years of pretty severe drought, a capability to deal with droughts if they go on and on.<sup>417</sup>

**8.36** Mr Evans also noted the natural evolution of the 2006 Progress Report from the 2004 Metropolitan Water Plan 2004. He described a process of technological change and improved understanding of the issues affecting the plan to provide a sustainable water supply for Sydney:

What happens over time is that you progress with these things: you lock in more knowledge and you are able to decide which ones can be implemented. So I just characterise these things as an evolution in that, over time, as technology changes, as your knowledge changes, your knowledge of climate changes and your understanding of the risk of drought severity changes, you will evolve the combination of measures you apply at any one time.<sup>418</sup>

**8.37** Accordingly, Mr Evans argued that the Metropolitan Water Plan 2006 builds on the previous strategies released by the Government and is based on a more adaptive approach to water management:

Rather than prescribing now how water needs will be met over the next 25 years, adaptive management means having the capacity to respond to circumstances as they change, taking advantage of new information and technologies as they emerge, and avoiding costs by deferring investment until it is needed. The approach adopted in this

<sup>415</sup> Mr Hector, Evidence, 20 March 2006, p64

<sup>416</sup> Mr Hector, Evidence, 20 March 2006, p66

<sup>417</sup> Mr Evans, Evidence, 23 March 2006, p3

<sup>418</sup> Mr Evans, Evidence, 23 March 2006, p12

Plan reflects this new thinking – particularly with respect to measures required to provide security of supply in deep drought.<sup>419</sup>

- 8.38** The new Plan indicates that the Government will prepare status reports each year on the analysis underpinning the projected supply and demand balance and that no developments have occurred that fundamentally alter the general approach of the Plan. Every four years a major review will be conducted and a new Plan will be produced. The first of these four-yearly reviews will commence in late 2007.<sup>420</sup>
- 8.39** The Metropolitan Water Plan 2006 also includes a commitment to engaging expert and community input more rigorously in relation to water management planning. The Plan advises that the Government will establish a Metropolitan Water Independent Review Panel to provide expert input on metropolitan water planning matters.<sup>421</sup> The Panel will comprise experts in relevant fields, such as urban water management, the economics of urban water systems, water conservation, attitudinal research and environmental issues and will advise the Government on how best to consult the community on water management issues and how those views can be integrated into water management planning.<sup>422</sup>

### **Committee comment**

- 8.40** The Committee supports the Government's commitment to long-term planning for Sydney's water management through the Metropolitan Water Plans, including the commitment to regular major reviews of the current plan every four years.
- 8.41** However, in undertaking this planning process, it is clear to the Committee that the various water management planning options for Sydney require more than simply economic assessment of their merits. A broader cost benefit analysis taking into account environmental and social considerations is required when developing Sydney's future water management strategies.
- 8.42** Accordingly, the Committee believes that the Government should apply a broader cost benefit analysis of the economic, social and environmental costs and benefits of water management options when developing Sydney's future Metropolitan Water Plans.

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### **Recommendation 20**

That the Government apply a broader cost benefit analysis of the economic, social and environmental costs and benefits of water management options when developing Sydney's future Metropolitan Water Plans.

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- 8.43** Coupled with this recommendation, the Committee strongly believes that Sydney Water should adopt enhanced strategies of community consultation. The Committee is concerned

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<sup>419</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p121

<sup>420</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p122

<sup>421</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p122

<sup>422</sup> NSW Government, *2006 Metropolitan Water Plan*, May 2006, p122

that, to date, Sydney Water has not done enough to reassure the community that the water management strategy it advocates is based on a sound decision-making process.

- 8.44** Enhanced community participation in the water planning process would also encourage the development of new and innovative water management strategies and decentralise the responsibility for providing water management solutions away from government.
- 8.45** Accordingly, the Committee welcomes the Government's commitment in the Metropolitan Water Plan 2006 to greater engagement of expert and community input, including through the establishment of a Metropolitan Water Independent Review Panel. However, to ensure the effectiveness of the Panel, the Committee believes that the Panel's recommendations on all metropolitan water planning matters should be made publicly available, together with the response from Sydney Water.
- 8.46** The Committee notes that the 2003 report of the Expert Water Panel entitled *A Sustainable Water Balance for Sydney* was never publicly released.

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#### **Recommendation 21**

That the recommendations of the Metropolitan Water Independent Review Panel on all metropolitan water planning matters be made publicly available, together with a response from Sydney Water.

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- 8.47** Finally, the Committee also believes that Sydney Water and the Metropolitan Water Independent Review Panel should be encouraged to engage with local councils when consulting on metropolitan water planning strategies for Sydney.

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#### **Recommendation 22**

That Sydney Water and the Metropolitan Water Independent Review Panel engage with local councils when consulting on metropolitan water planning strategies for Sydney.

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## Appendix 1 Submissions

| No | Author  |
|----|---|
| 1  | Mr Stewart Fist   |
| 2  | Mrs Vicki McGregor  |
| 3  | Mr Irwin Saunders   |
| 4  | Mr Richard Bates  |
| 5  | Ms Terri Southwell  |
| 6  | Mr Mike Shaddick  |
| 7  | Mr Steve Maxwell  |
| 8  | Mr William Forrester  |
| 9  | Mr Ross Woodfield (Water Innovations Pty Ltd)                           |
| 10 | Mr Peter Hatley   |
| 11 | Dr Jennifer Scott (University of Western Sydney)                        |
| 12 | Mr R J Sendt (The Audit Office of NSW)                                  |
| 13 | Clr Denise Wilton (Mosman Municipal Council)                            |
| 14 | Ms Ellen O'Brien (Coast and Wetlands Society Inc.)                      |
| 15 | Ms Melinda Coles  |
| 16 | Dr Judith Greenwood   |
| 17 | Mr Jeremy Hill  |
| 18 | Confidential  |
| 19 | Ms Alison Potter  |
| 20 | Ms Linda Coyle  |
| 21 | Ms Jemilah Hallinan   |
| 22 | Dr Stuart Khan (Centre for Water & Waste Technology, University of NSW) |
| 23 | Mr Philip Collins   |
| 24 | Mr Richard Maguire  |
| 25 | Mr Peter Hopper   |
| 26 | Mr Neville Gillmore   |
| 27 | Mr Matt Mushalik  |
| 28 | Sister Sheila Quonoey (Presentation Sisters Wagga)                      |
| 29 | Ms Naomi Waizer   |
| 30 | Ms Irene Young  |
| 31 | Mr Robert Shaw  |
| 32 | Cr Genia McCaffery (Local Government Association of NSW)                |

| <b>No</b> | <b>Author</b>  |
|-----------|--|
| 33        | Mr Ted Seng (Randwick City Council)  |
| 34        | Ms Lesley Cox (Oatley Flora and Fauna Conservation Society Inc.)                   |
| 35        | Mr & Mrs Robin & Robin Dickson   |
| 36        | Ms Candy Nay (Marrickville Council)  |
| 37        | Mr R.D. Walshe (Combined Community Groups of Sutherland Shire)                     |
| 38        | Mr Roland van Amstel (Imatech Water Technologies Pty Ltd)                          |
| 39        | Mr Martin O'Reilly   |
| 40        | Mr Norman Delmas   |
| 41        | Miss Laura Eadie   |
| 42        | Mr Gordon Hocking (Sustainable Population Australia Inc)                           |
| 43        | Mr Alan Lawrence   |
| 44        | Mr Guenter Hauber-Davidson (Energy Conservation Systems Pty Ltd)                   |
| 45        | Dr Tony Recsei (Save Our Suburbs (SOS) NSW Inc)                                    |
| 46        | Mr Warwick McDonald (Commonwealth Scientific and Industrial Research Organisation) |
| 47        | Dr Greg Leslie (University of New South Wales)                                     |
| 48        | Miss Emma James  |
| 49        | Mr John Boothroyd (Sydney Branch of Australian Conservation Foundation)            |
| 50        | Mr Darrell Barton (iPools Australia)   |
| 51        | Ms Kristin Flanders (Waterwise Systems)  |
| 52        | Mr Leigh Martin (Total Environment Centre)   |
| 53        | Ms Julie Simpson   |
| 54        | Ms Cate Faehrmann (Nature Conservation Council of NSW)                             |
| 55        | Mr & Mrs John & Jenny Kubale   |
| 56        | Ms Adrienne Shilling   |
| 57        | Mr Philip van der Kolff  |
| 58        | Mr Jeff Thompson (Leichhardt Council)  |
| 59        | Mr Frederick Bell  |
| 60        | Mr Donald Hector (The Warren Centre for Advanced Engineering)                      |
| 61        | Mr John van der Merwe (Services Sydney Pty Ltd)                                    |
| 62        | Ms Jennifer Fitzgerald   |
| 63        | Mr & Mrs K Fitzgerald  |
| 64        | Ms Fiona Lobb  |
| 65        | Mr & Mrs Mac & Joyce McCaullough   |
| 66        | Mr Andrew Tan  |

| <b>No</b> | <b>Author</b>                    |
|-----------|----------------------------------|
| 67        | Mr N Anstey                      |
| 68        | Ms J Mitchell                    |
| 69        | Mr & Mrs Ron & Patricia Douglass |
| 70        | Ms Hannah Brumerskyj             |
| 71        | Ms Lorraine Coote                |
| 72        | Mr John Lo                       |
| 73        | Ms Nicola Noakes                 |
| 74        | Mr Mitchell Roggenkamp           |
| 75        | Mr David Martin                  |
| 76        | Ms Lyn Everingham                |
| 77        | Ms Lynn Paterson                 |
| 78        | Ms Vicki Vaccarella              |
| 79        | Ms Judith Calland-Green          |
| 80        | Mr C.K. Smith                    |
| 81        | Mr Colin Wood                    |
| 82        | Mr Duke Ferguson                 |
| 83        | Ms Annette Fitzallen             |
| 84        | Mr P Mitchell                    |
| 85        | Mr S Gibbons                     |
| 86        | Mrs T Kinsella                   |
| 87        | Mr J Rawley                      |
| 88        | Ms Pam Kendrick                  |
| 89        | Mr Garry Mullhorn                |
| 90        | Ms Vivienne Wood                 |
| 91        | Ms Joyce Fu                      |
| 92        | Mr K Cavanagh                    |
| 93        | Mrs & Mr Sandra & Limbert Herbas |
| 94        | Ms Amelia Hodge                  |
| 95        | Ms Liddy Croft                   |
| 96        | Ms Annette Acheson               |
| 97        | Ms Sheree Ferrett                |
| 98        | Mrs & Mr Olga & Bric Azid        |
| 99        | Ms Rose Hills                    |
| 100       | Ms Vicki Knight                  |
| 101       | Mr S Bach                        |

| <b>No</b> | <b>Author</b>   |
|-----------|---|
| 102       | Mr Burt Stuut   |
| 103       | Mrs W Stuut   |
| 104       | Ms Anne Jacklyn   |
| 105       | Mr George Jacklyn   |
| 106       | Mr Burt Bach  |
| 107       | Mr Allan West   |
| 108       | Mr Fred Geoffrey  |
| 109       | Ms V Godfrey  |
| 110       | Ms Dianne Stevens   |
| 111       | Mr John Stevens   |
| 112       | Ms Kirrily Jones  |
| 113       | Ms Rhondda Tissington   |
| 114       | Mr Michael Belfield   |
| 115       | Mr Michael Mulhern  |
| 116       | Ms Beverly Milne  |
| 117       | Mr Ron Dortins  |
| 118       | Mrs Louise Dortins  |
| 119       | Mr John Boole   |
| 120       | Ms Mia Srindells  |
| 121       | Mr & Mrs Kay & Clay Tompkins  |
| 122       | Mrs Margaret McLoughlin   |
| 123       | Mr Christian Kai  |
| 124       | Mr Jim Harvey   |
| 125       | Mr Ian Kiernan (Clean Up Australia Ltd)                             |
| 126       | Ms Patricia Harvey (Sydney Coastal Councils Group)                  |
| 127       | Ms Anne Reeves  |
| 128       | The Hon Morris Iemma MP (NSW Government)                            |
| 129       | Mr John Rayner (Sutherland Shire Council)                           |
| 130       | Mr Henry Wong (Manly Council)                                       |
| 131       | Ms Clover Moore MP (Member for Bligh)                               |
| 132       | Ms Mary Howard  |
| 133       | Prof Charles Essery (University of Western Sydney)                  |
| 134       | Mr Terry Barratt (Shoalhaven River Alliance)                        |
| 135       | Mr Robert Thorne (partially confidential)                           |
| 136       | Mr Steve Nichols (Hawkesbury-Nepean Catchment Management Authority) |

## Appendix 2 Witnesses

| <b>Date</b>                                      | <b>Name</b>            | <b>Position and Organisation</b>  |
|--|------------------------|---|
| Friday 10 March 2006<br>Public Hearing, Sydney   | Mr Ian Kiernan         | Chairman, Clean Up Australia Ltd  |
|  | Dr Charles Essery      | Adjunct Professor, School of Engineering & Industrial Design, University of Western Sydney                  |
|  | Clr Sam Byrne          | Executive Member, Local Government Association of NSW   |
|  | Clr Ken McDonell       | Executive Member, Local Government Association of NSW   |
|  | Mr John van der Merwe  | Director, Services Sydney Pty Ltd   |
|  | Mr Leigh Martin        | Urban Campaigner, Total Environment Centre  |
|  | Clr Kelly Knowles      | Sutherland Shire Council  |
|  | Mr Ian Drinnan         | Principal Environmental Scientist, Sutherland Shire Council   |
| Monday 20 March 2006<br>Public Hearing, Sydney   | Ms Roya Sheikholeslami | President, Australian Desalination Association  |
|  | Dr Greg Leslie         | Associate Professor, School of Chemical Engineering and Industrial Chemistry, University of New South Wales |
|  | Dr Stuart Khan         | Research Fellow, Centre for Water & Waste Technology, University of New South Wales                         |
|  | Mr Peter Prineas       | Executive Member, Nature Conservation Council of NSW  |
|  | Dr Nicholas Ashbolt    | Associate Professor, School of Civil and Environmental Engineering, University of New South Wales           |
|  | Mr Bob Wilson          | Member, Waterways Advisory Panel  |
|  | Mr Ross Young          | Executive Director, Water Services Association of Australia   |
|  | Dr Noel Merrick        | Director, National Centre for Groundwater Management  |
| Thursday 23 March 2006<br>Public Hearing, Sydney | Mr Donald Hector       | Project Chairman, The Warren Centre for Advanced Engineering  |
|  | Mr David Evans         | Managing Director, Sydney Water   |
|  | Mr David Nemptzow      | Director General, Department of Energy, Utilities and Sustainability  |
|  | Mr Graeme Head         | Managing Director, Sydney Catchment Authority   |
|  | Ms Lisa Corbyn         | Director General, Department of Environment and Conservation  |
|  | Mr Sam Haddad          | Director General, Department of Planning  |

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| <b>Date</b> | <b>Name</b>       | <b>Position and Organisation</b>  |
|-------------|-------------------|---|
|             | Mr R.D. Walshe    | Chairman, Combined Community Groups of Sutherland Shire and Sutherland Environment Centre |
|             | Ms Annette Hogan  | Combined Community Groups of Sutherland Shire and Sutherland Environment Centre           |
|             | Mr Nick Boes      | Combined Community Groups of Sutherland Shire and Sutherland Environment Centre           |
|             | Mr Terry Barratt  | Chair, Shoalhaven River Alliance  |
|             | Mr Robert Thorne  | Shoalhaven River Alliance   |
|             | Mr Steven Lellyet | Deputy Regional Director, Bureau of Meteorology   |

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## Appendix 3 Tabled documents

### Friday 10 March 2006

#### Public hearing, Parliament House

1. Sutherland Shire Council: Presentation to the Inquiry into a Sustainable Water Supply for Sydney 10 March 2006 - *tabled by Mr Ian Drinnan.*

### Monday 20 March 2006

#### Public hearing, Parliament House

2. How to get the Process Right & Missed Opportunities, hardcopy of PowerPoint presentation, *tabled by Professor Nicholas Ashbolt*
3. Groundwater, hardcopy of PowerPoint presentation, *tabled by Dr Noel Merrick*

### Thursday 23 March 2006

#### Public hearing, Parliament House

4. Two photographs of a roadside view of part of the desalination pilot plant site at Kurnell, *tabled by Mr Robert Walshe*
5. Combined Community Groups of Sutherland Shire Concerned with Water-saving in Greater Sydney – Oral statement on a sustainable water supply for Sydney, *tabled by Mr Robert Walshe*
6. Impact on the Shoalhaven Estuary of Diversion of River Flows at Tallowa Dam; Presentation and Supplementary Graphs; Thursday 23 March 2006, *tabled by Mr Robert Thorne* (partially confidential)
7. NSW and Sydney Water Catchment Rainfall Trends, hard copy of PowerPoint presentation, *tabled by Mr Stephen Lellyet*

## Appendix 4 Minutes of proceedings

### Minutes No 47

Thursday, 1 December 2005

At Parliament House at 1.05 pm, the Parkes Room

#### 1. Members Present

Mr Ian Cohen (Chair)  
 Mr Rick Colless  
 Mr Greg Donnelly  
 Ms Sylvia Hale  
 Mr Don Harwin  
 Ms Penny Sharpe (Catanzariti)  
 Mr Henry Tsang

#### 2. Correspondence

##### *Received*

- Letter received from Mr Ian Cohen MLC, Mr Don Harwin MLC, Mr Rick Colless MLC and Ms Sylvia Hale MLC (members of GPSC 5) requesting that the Committee meet to discuss a proposed inquiry into a sustainable water supply for Sydney (30 November 2005).

#### 3. Proposed self reference – Inquiry into a sustainable water supply for Sydney

Mr Donnelly moved that the issue of the development of a desalination plant at Kurnell be referred to the State Development Committee for consideration.

Question put.

The Committee divided.

Ayes: Mr Donnelly, Ms Sharpe, Mr Tsang

Noes: Mr Cohen, Mr Colless, Ms Hale, Mr Harwin.

Question resolved in the negative.

Mr Harwin moved that the following terms of reference be adopted:

That General Purpose Standing Committee No. 5 inquire into and report on a sustainable water supply for Sydney and, in particular:

- a. The environmental impact of the proposed desalination plant at Kurnell
- b. The environmental assessment process associated with the proposed desalination plant

- c. Methods for reducing the use of potable water for domestic, industrial, commercial and agricultural purposes, including sustainable water consumption practices
- d. The costs and benefits of desalination and alternative sources of water including recycled wastewater, groundwater, rainwater tanks and stormwater harvesting
- e. Practices concerning the disposal of trade waste
- f. The tender process and contractual arrangements, including public-private partnerships, in relation to the proposed desalination plant, and
- g. Any other relevant matter.

Question put.

The Committee divided.

Ayes: Mr Cohen, Mr Colless, Mr Harwin, Ms Hale

Noes: Mr Donnelly, Ms Sharpe, Mr Tsang.

Question resolved in the affirmative.

Resolved, on the motion of Ms Hale, that the Inquiry into a sustainable water supply for Sydney be advertised in the Sydney Morning Herald and the Daily Telegraph, as well as the St George and Sutherland Shire Leader, the South Coast Register, the Illawarra Mercury and the Southern Courier on or around 10 December 2005.

#### **4. Adjournment**

The Committee adjourned at 1.20 pm until 27 February at 12:00pm.

#### **Victoria Pymm**

Senior Council Officer

#### **Minutes No 51**

Monday, 27 February 2006

At Parliament House at 12.05 pm, Room 1108

#### **1. Members Present**

Mr Ian Cohen (Chair)

Mr Rick Colless

Mr Greg Donnelly

Ms Sylvia Hale

Ms Patricia Forsythe (Harwin)

Mr Peter Primrose (Catanzariti)

Mr Henry Tsang

#### **2. Substitute Members**

The Chair noted the written advice dated 2 February 2006 from the Opposition Whip advising that Ms Forsythe would be substituting for Mr Harwin for all meetings relating to the Inquiry into a Sustainable Water Supply for Sydney.

The Chair noted the written advice dated 2 February 2006 from the Government Whip advising that Mr Primrose would be substituting for the Mr Catanzariti for all meetings relating to the Inquiry into a Sustainable Water Supply for Sydney.

### 3. Confirmation of Minutes

Resolved on the motion of Mr Donnelly: That Minutes No 47 be confirmed.

### 4. Correspondence

The Committee noted the following items of correspondence:

#### *Sent*

The Chair wrote to the following stakeholders on 22 December 2005 advising of the Inquiry into a Sustainable Water Supply for Sydney and inviting submission:

- Sydney Water
- Department of Energy, Utilities and Sustainability
- Department of Environment and Conservation
- Department of Natural Resources
- Department of Health
- Department of Planning
- State Water
- Sydney Catchment Authority
- NSW Ministry of Science
- NSW Heritage Office
- Department of Primary Industries
- Minister for Utilities, Hon Carl Scully
- Minister for Environment, Hon Bob Debus
- Sutherland Shire Council, Mayor Kevin Schreiber
- Councillor Kelly Knowles, Chair, Sutherland Shire Desalination Plant Working Party
- Ron Page, Mayor, Broken Hill City Council
- Port Macquarie-Hastings Council
- Manly Council
- Senator Ian Campbell, Minister for the Environment and Heritage
- Australian Department of the Environment and Heritage
- WA Department of Environment
- WA Water Corporation
- Australasian Desalination Association (ADA)
- Australian Conservation Foundation, Sydney Branch
- Australian Water Services
- Greenpeace
- CSIRO
- Total Environment Centre
- Mr Ian Kiernan, Clean Up Australia
- Nature Conservation Council of NSW
- Country Energy
- Australian Institute of Environmental Health

- Waterwatch NSW
- Bluescope Steel, Wollongong
- National Water Commission
- Macquarie Generation
- Australian Greenhouse Office
- Ms Tanya Plibersek, Member for Sydney
- NSW Auditor-General
- IPART
- Shoalhaven River Alliance
- Sydney Coastal Councils Group
- Sutherland Shire Environment Centre
- Manly Environment Centre
- Local Government Association
- Southern Sydney Regional Organisation of Councils
- Mr Harley Wright, Total Catchment Management
- Oceanwatch
- Mr Bob Wilson and Mr David Harley, Waterways Advisory Panel
- Memtec
- Mr Chris Rochfort and Mr Umberto Urriola, Oscar Larach Atlantis Corp
- Services Sydney
- Professor Richard Kingsford, Professor of Environmental Science at UNSW
- UNESCO Centre for Membrane Science and Technology at UNSW
- Head, Sydney University, Faculty of Science, School of Environmental and Marine Sciences
- Professor Nick Klomp, Head, School of Environmental and Informational Sciences, Charles Sturt University
- Professor Colin Murray-Wallace, Head of School, School of Earth and Environmental Sciences, Faculty of Science, University of Wollongong
- Professor Mick Wilson, Dean, College of Science, Technology and Environment, University of Western Sydney
- Centre for Eco-toxicology, Department of Environmental Sciences, University of Technology, Sydney
- National Centre for Groundwater Management, University of Technology, Sydney
- Department of Environmental and Life Sciences, Macquarie University
- School of Environmental Science and Management, Southern Cross University
- The Centre for Water and Waste Tehnology, School of Civil and Environmental Engineering, University of New South Wales
- Dr Charles Essery, University of Western Sydney/ Sustainable Water Solutions
- Dr Stuart White, Institute of Sustainable Futures, UTS
- Mr Nick Ashbolt and Mr Greg Leslie, Kensington Group, UNSW.

*Received*

- Letter received 2 February 2006 from the Director General, The Cabinet Office, New South Wales to Committee Chair advising that the Government will be making a consolidated submission to the Inquiry into a Sustainable Water Supply for Sydney.

- Letter dated 9 February 2006 from the Director, Services Sydney Pty Ltd to Committee Chair regarding the potential publication of sensitive information in the final or interim report of the Committee.
- Letter dated 7 February 2006 from the Managing Director & CEO, BlueScope Steel to Committee Chair respectfully declining to make a formal submission to the Inquiry into a Sustainable Water Supply for Sydney.
- Letter dated 16 February 2006 from General Manager, The Weather Channel to Committee Director enclosing DVD copies of the series *Running on Empty* and the on-air debate *Desalination – Good Sense or Nonsense* for reference of the Committee.

*Correspondence from Services Sydney Pty Ltd*

Resolved on the motion of Mr Colless: That the correspondence dated 9 February 2006 from the Director, Services Sydney Pty Ltd to the Committee Chair and Committee Members remain confidential to the Committee.

Resolved on the motion of Mr Colless: That the Chair, on behalf of the Committee, write to the Director, Services Sydney Pty Ltd advising of the Committee's consideration of the concerns raised by Services Sydney in their correspondence dated 9 February 2006.

Resolved on the motion of Mr Colless: That the correspondence from the Committee Chair to the Director, Services Sydney Pty Ltd remain confidential to the Committee.

## 5. Inquiry into a Sustainable Water Supply for Sydney

### *Publication of Submissions*

Resolved on the motion of Mr Tsang: That the Committee publish all submissions received up to and including Submission No 130, with the exception of those submissions that the Committee has resolved should remain confidential, in full or part, to the Committee.

Resolved on the motion of Ms Hale: That submission No 18 remain confidential to the Committee.

### *Placing submissions on the Committee website*

The Committee noted the impracticality of placing all submissions received on the committee website, and that some submissions included attachments that were public documents. The Committee noted its anticipation that there would be requests from inquiry stakeholders for access to key submissions including the submissions of those stakeholders appearing as witnesses before the Committee.

Resolved on the motion of Mr Colless: That it be left in the hands of the Committee secretariat to place on the inquiry website all or part of key public submissions, including public submissions by those persons or organisations appearing as witnesses before the Committee; and that the inquiry website include an acknowledgement of the number of submissions received, a list of all submissions authors, and of the reasons for placing only selected submissions on the website.

### *Potential witnesses*

Resolved on the motion of Mr Primrose: That the Committee invite the following persons/organisations to appear as a witness at a public hearing on the Inquiry into a Sustainable Water Supply for Sydney:

- Mr David Evans, CEO, Sydney Water
- Mr David Nemptzow, DG, Energy, Utilities and Sustainability
- Mr Graeme Head, Managing Director, Sydney Catchment Authority
- Mr Sam Haddad, DG, Department of Planning
- Ms Lisa Corbyn, DG, Environment and Conservation
- Local Government Association of NSW
- Sutherland Shire Council
- Marrickville Council
- Combined Community Groups of Sutherland Shire
- Sydney Coastal Councils Group
- Dr Stuart Khan, UNSW Centre for Water & Waste Technology
- Professor Stuart White, Institute of Sustainable Futures, UTS
- Dr Noel Merrick, National Centre for Groundwater Management, UTS
- Associate Professor Greg Leslie, School of Chemical Engineering and Industrial Chemistry, UNSW
- Mr Charles Essery, adjunct professor, School of Engineering, UWS
- Dr Nicholas Ashbolt, School of Civil & Environmental Engineering, UNSW
- The Warren Centre, Sydney University
- CSIRO
- Mr Ross Young, Executive Director, Water Services Association of Australia
- Nature Conservation Council of NSW
- Total Environment Centre
- Mr Ian Kiernan, Clean Up Australia Ltd
- Ms Roya Sheikholeslami, Australian Desalination Association
- Mr Bob Wilson
- Sutherland Environment Centre
- Shoalhaven River Alliance
- Hawkesbury Nepean Catchment Foundation
- AGL
- Services Sydney Pty Ltd.

***Public hearings and site visits***

Resolved on the motion of Mr Primrose: That the Committee conduct public hearings at Parliament House for its inquiry into a Sustainable Water Supply for Sydney on the following dates:

- Friday 10 March
- Monday 20 March
- Thursday 23 March.

**6. Australian Water Summit Sydney 2006**

The Committee noted the programme for the Australian Water Summit Sydney 2006 being held on the 13 and 14 March 2006 at the Sydney Convention and Exhibition Centre. The Committee noted the relevance of the conference to the Inquiry's terms of reference.

Resolved on the motion of Mr Primrose: That the Committee authorise the cost of the attendance by the Chair, Deputy Chair and one secretariat member at the Australian Water Summit Sydney 2006.

## 7. **Adjourned**

The Committee adjourned at 12.35 pm *sine die*.

## **Victoria Pymm**

Senior Council Officer

## **Minutes No 53**

Friday, 10 March 2006

Jubilee Room, Parliament House at 10:00am

### 1. **Members Present**

Mr Ian Cohen (Chair)

Mr Rick Colless (Deputy Chair)

Mr Greg Donnelly

Ms Sylvia Hale

Ms Patricia Forsythe (until 3:30pm)

Mr Peter Primrose

Mr Henry Tsang

### 2. **Inquiry into a Sustainable Water Supply for Sydney – Public Hearing**

Witnesses, the public and the media were admitted.

The Chair made a brief opening statement.

Mr Ian Kiernan, AO, Chairman, Clean Up Australia Ltd and Ms Gabrielle Kay, Manager, Clean Water Campaign, Clean Up Australia Ltd were affirmed and examined.

Evidence concluded and the witnesses withdrew.

Prof Charles Essery, independent water consultant was sworn and examined.

Evidence concluded and the witness withdrew.

Clr Sam Byrne, Executive Member, Local Government Association of NSW and Mayor, Marrickville Council affirmed and examined; and Clr Ken McDonell, Executive Member, Local Government Association of NSW and Mr Ryan Fletcher, Director, Policy and Research, Local Government Association of NSW were sworn and examined.

Evidence concluded and the witnesses withdrew.

Mr John van der Merve, Director, Services Sydney Pty Ltd was sworn and examined.

Evidence concluded and the witness withdrew.

Mr Leigh Martin, Urban Campaigner, Total Environment Centre was affirmed and examined.

Evidence concluded and the witness withdrew.

Clr Kelly Knowles, Sutherland Shire Council and Mr Ian Drinnan, Principal Environmental Scientist, Sutherland Shire Council were sworn and examined.

Mr Drinnan tendered a document entitled: *Sutherland Shire Council: Presentation to the Inquiry into a Sustainable Water Supply for Sydney 10 March 2006*.

Evidence concluded and the witnesses withdrew.

Ms Roya Sheikholeslami, President, Australian Desalination Association was sworn and examined.

Evidence concluded and the witness withdrew.

The public and the media withdrew.

### **3. Deliberative meeting**

The Committee deliberated at 4:34pm.

#### ***Confirmation of minutes***

Resolved on motion of Mr Primrose: That Minutes Nos 51 and 52 be confirmed.

#### ***Correspondence***

The Committee noted the following items of correspondence:

##### *Sent*

- Letter dated 2 March 2006 from the Chair to the Minister for Water Utilities advising of the inquiry and of the invitation extended to the CEO, Sydney Water to give evidence before the Committee.
- Letter dated 1 March 2006 from the Chair to the Minister for Planning advising of the inquiry and of the invitation extended to the Director General, Department of Planning to give evidence before the Committee.
- Letter dated 2 March 2006 from the Chair to the Minister for Energy advising of the inquiry and of the invitation to the Director General, Department of Energy, Utilities and Sustainability to give evidence before the Committee.
- Letter dated 2 March 2006 from the Chair to the Minister for the Environment advising of the inquiry and of the invitation extended to both the Director General, Department of Environment and Conservation and the Managing Director, Sydney Catchment Authority to give evidence before the Committee.

#### ***Publication of submissions***

Resolved on motion of Mr Donnelly: That the Committee publish submission Nos 131, 132, 133 and 134.

***Document tendered to Committee during public hearing***

Resolved on motion of Mr Primrose: That the Committee accept the document entitled *Sutherland Shire Council: Presentation to the inquiry into a Sustainable Water Supply for Sydney 10 March 2006* that was tendered to the Committee by Mr Ian Drinnan during the public hearing.

Resolved on motion of Ms Hale: That the Committee publish the document entitled: *Sutherland Shire Council: Presentation to the inquiry into a Sustainable Water Supply for Sydney 10 March 2006*.

***Visit of inspection***

The Committee deliberated.

Resolved on motion of Mr Primrose: That the Committee conduct a visit of inspection of water recycling projects in north-west Sydney on Wednesday 22 March 2006.

**4. Adjournment**

The Committee adjourned at 4:45 pm until 9:45am on Monday 20 March 2006 in Room 814/815, Parliament House.

**John Young**

Clerk to the Committee

**Minutes No 54**

Monday, 20 March 2006

Room 814/815, Parliament House at 9:45am

**1. Members Present**

Mr Ian Cohen (Chair)  
 Mr Rick Colless (Deputy Chair)  
 Mr Greg Donnelly (until 4:30pm)  
 Ms Sylvia Hale  
 Ms Patricia Forsythe  
 Mr Peter Primrose (after item 4 and until 2:45pm)  
 Mr Henry Tsang (after item 4.)

**2. Confirmation of Minutes**

Resolved on motion of Mr Donnelly: That Minutes No 53 be confirmed.

**3. Correspondence**

The Committee noted the following items of correspondence.

*Sent*

- Letters dated 13 March 2006 from Committee Secretariat to the following witnesses indicating the questions taken on notice by those witnesses at the public hearing on 10 March 2006:
  - Clean Up Australia Ltd
  - Local Government Association of NSW
  - Services Sydney Pty Ltd.

*Received*

- Letter dated 17 February 2006 from Senator the Hon Ian Campbell, federal Minister for the Environment and Heritage to the Committee Chair advising that the Department of Environment and Heritage would decline the opportunity to make a submission to the Inquiry into a Sustainable Water Supply for Sydney.
- E-mail received 14 March 2006 from Ms Gabrielle Kay containing the answers to questions taken on notice by representatives from Clean Up Australia Ltd at the public hearing on 10 March 2006.

**4. Publication of submissions**

Resolved on motion of Mr Donnelly: That the Committee publish submission No 135 with the exception of the section titled 'Confidentiality' and the attachment containing data on salinity levels both of which shall remain confidential to the Committee.

Resolved on motion of Mr Donnelly: That the Committee publish submission No 136.

**5. Inquiry into a Sustainable Water Supply for Sydney – Public Hearing**

Witnesses, the public and the media were admitted.

The Chair made a brief opening statement.

Dr Gregory Leslie, Associate Professor, School of Chemical Engineering, University of New South Wales was sworn and examined.

Evidence concluded and the witness withdrew.

Dr Stuart Khan, Research Fellow, Centre for Water and Waste Technology, University of New South Wales was affirmed and examined.

Evidence concluded and the witness withdrew.

Mr Peter Prineas, Member of the Executive, Nature Conservation Council of New South Wales Inc was sworn and examined.

Evidence concluded and the witnesses withdrew.

Professor Nicholas Ashbolt, Associate Professor, School of Civil and Environmental Engineering, University of New South Wales was affirmed and examined.

Professor Ashbolt tendered a hard copy of his powerpoint presentation to the Committee entitled: *How to get the Process Right & Missed Opportunities*.

Evidence concluded and the witness withdrew.

Mr Robert Wilson, Board Member, Hawkesbury-Nepean Catchment Management Authority was affirmed and examined.

Evidence concluded and the witness withdrew.

Mr Ross Young, Executive Director, Water Services Association of Australia was affirmed and examined.

Evidence concluded and the witness withdrew.

Dr Noel Merrick, Director, National Centre for Groundwater Management, University of Technology was sworn and examined.

Dr Merrick tendered a hard copy of his powerpoint presentation to the Committee entitled: *Groundwater*.

Evidence concluded and the witness withdrew.

Mr Donald Hector, Co-chair, Metropolitan Water Options Project, Warren Centre for Advanced Engineering was sworn and examined.

Evidence concluded and the witness withdrew.

The public and the media withdrew.

## 6. **Deliberative meeting**

The Committee deliberated at 5:18pm.

### ***Documents tendered to Committee during public hearing***

Resolved on motion of Mr Colless: That the Committee accept and publish the document entitled *How to get the Process Right & Missed Opportunities* that was tendered to the Committee by Professor Ashbolt during the public hearing.

Resolved on motion of Mr Tsang: That the Committee accept and publish the document entitled: *Groundwater* that was tendered to the Committee by Dr Merrick during the public hearing.

### ***Correspondence***

The Committee deliberated.

Resolved on motion of Ms Hale: That the Committee write to Gosford City Council and to Wyong Shire Council requesting written information on the strategies being implemented in each local government area to increase their respective water supply and to reduce potable water demand.

Resolved on motion of Ms Forsythe: That the Committee write to the Manager, Albury Water requesting written information on the water reuse measures implemented and maintained by Albury Water, the pricing scheme in place at Albury Water and the community reception to the pricing scheme.

### ***Additional Witness***

Resolved on motion of Mr Colless: That the Committee extend an invitation to the Australian Bureau of Meteorology for a representative of that organisation to appear and give evidence before the Committee.

## 7. Adjournment

The Committee adjourned at 5:35 pm until 9:30am on Wednesday 22 March 2006 (site visit).

## John Young

Clerk to the Committee

## Minutes No 55

Wednesday, 22 March 2006

Parliament House at 9:30am

### 1. Members Present

Mr Ian Cohen (Chair)

Mr Rick Colless (Deputy Chair)

Mr Greg Donnelly (until conclusion of item 3.1)

Ms Sylvia Hale (after item 3.1)

Ms Patricia Forsythe (after item 3.1)

Mr Henry Tsang

### 2. Apologies

Mr Primrose

### 3. Inquiry into a Sustainable Water Supply for Sydney – site visit

#### *Sydney Olympic Park Authority*

Drive to Sydney Olympic Park Authority Office, 7 Figtree Drive, Sydney Olympic Park.

The Committee was met at 10:30am by Mr Brian Newman, CEO, Sydney Olympic Park Authority (SOPA) and Mr Andrej Listowski, Senior Manager, Water and Energy, SOPA.

Mr Newman and Mr Listowski gave a presentation on the Water Reclamation and Management Scheme for Sydney Olympic Park.

Mr Listowski provided the Committee with copies of a document entitled: *Recycled Water System for Future Urban Development, 2005*.

Mr Listowski accompanied the Committee on a tour of the integrated sewage treatment and water reclamation facilities at Sydney Olympic Park.

#### *Rouse Hill Recycled Water Plant*

Drive to Rouse Hill Recycled Water Plant, Lot 3, Mile End Road, Rouse Hill.

The Committee was met at 1:00pm by Mr David Evans, Managing Director, Sydney Water and Ms Yvonne Sinanovic, Plant Manager, Rouse Hill Recycled Water Plant.

Mr Evans and Ms Sinanovic gave a brief presentation on the Rouse Hill Project Area and the water recycling and dual reticulation system.

Mr Evans provided the Committee with copies of a document containing maps, graphs and diagrams relating to the recycled water process; water use behaviour; sewage treatment plants, water filtration and pumping stations and Sydney's drinking water catchments.

Mr Evans and Ms Sinanovic accompanied the Committee on a tour of the sewage treatment and water recycling facilities at Rouse Hill Water Treatment Plant.

#### 4. **Adjournment**

The Committee adjourned at 3:10 pm until Thursday 23 March 2006 at 10:00am (public hearing).

#### **John Young**

Clerk to the Committee

#### **Minutes No 56**

Thursday, 23 March 2006

Jubilee Room, Parliament House at 10:00am

#### 1. **Members Present**

Mr Ian Cohen (Chair)

Mr Rick Colless (Deputy Chair)

Mr Greg Donnelly

Ms Sylvia Hale

Ms Patricia Forsythe (until 4:45pm)

Mr Peter Primrose

Mr Henry Tsang

#### 2. **Inquiry into a Sustainable Water Supply for Sydney – Public Hearing**

Witnesses, the public and the media were admitted.

The Chair made a brief opening statement.

Mr David Evans, Managing Director, Sydney Water; Mr David Nemptzow, Director General, Department of Energy, Utilities and Sustainability; and Mr Graeme Head, Chief Executive Officer, Sydney Catchment Authority were sworn and examined.

Evidence concluded and the witnesses withdrew.

Ms Elisabeth Corbyn, Director General, Department of Environment and Conservation was affirmed and examined; and Mr Sam Haddad, Director General, Department of Planning was sworn and examined.

Evidence concluded and the witnesses withdrew.

Ms Annette Hogan, Member, Combined Community Groups of Sutherland Shire Concerned with Water-saving in Greater Sydney; Mr Robert Walshe, Convenor, Combined Community Groups of Sutherland Shire Concerned with Water-saving in Greater Sydney; and Mr Klaas Boes,

representative, Kurnell Progress and Precinct Association Incorporated were affirmed and examined.

Mr Walshe tendered two photographs of a roadside view of part of the desalination pilot plant site at Kurnell.

Mr Walshe tendered a document entitled: *Combined Community Groups of Sutherland Shire Concerned with Water-saving in Greater Sydney – Oral statement on a sustainable water supply for Sydney.*

Evidence concluded and the witnesses withdrew.

Mr Terrence Barratt, Chair, Shoalhaven River Alliance; and Mr Robert Thorne, Member, Shoalhaven River Alliance were affirmed and examined.

Mr Thorne tendered a document entitled: *Impact on the Shoalhaven Estuary of Diversion of River Flows at Tallowa Dam; Presentation and Supplementary Graphs; Thursday 23 March 2006.*

Evidence concluded and the witnesses withdrew.

Mr Stephen Lellyett, Deputy Regional Director (NSW), Bureau of Meteorology was affirmed and examined.

Mr Lellyett tendered a hard copy of a powerpoint presentation entitled: *NSW and Sydney Water Catchment Rainfall Trends.*

Evidence concluded and the witness withdrew.

The public and the media withdrew.

### **3. Deliberative meeting**

The Committee deliberated at 5:05pm.

#### ***Documents tendered to Committee during public hearing***

Resolved on motion of Mr Tsang: That the Committee accept and publish the two photographs and the document entitled: *Combined Community Groups of Sutherland Shire Concerned with Water-saving in Greater Sydney – Oral statement on a sustainable water supply for Sydney* that were tendered to the Committee by Mr Walshe during the public hearing.

Resolved on motion of Mr Colless: That the Committee accept and publish the document entitled: *Impact on the Shoalhaven Estuary of Diversion of River Flows at Tallowa Dam; Presentation and Supplementary Graphs; Thursday 23 March 2006*, that was tendered to the Committee by Mr Thorne during the public hearing with the exception of the statistical data and graphs which shall remain confidential to the Committee.

Resolved on motion of Mr Colless: That the Committee accept and publish the document entitled: *NSW and Sydney Water Catchment Rainfall Trends* that was tendered to the Committee by Mr Lellyett during the public hearing.

#### ***Correspondence***

Resolved on motion of Mr Donnelly: That the Committee write to Caltex Australia requesting information on the feasibility of the Caltex Refinery at Kurnell making use of the treated water from the Cronulla sewage treatment plant for its industrial processes.

#### 4. **Adjournment**

The Committee adjourned at 5:10 pm *sine die*.

#### **John Young**

Clerk to the Committee

#### **Minutes No 57**

Thursday, 1 June 2006

Room 1108 at Parliament House at 10:05am

#### 1. **Members Present**

Mr Ian Cohen (Chair)  
 Mr Rick Colless (Deputy Chair)  
 Mr Greg Donnelly  
 Ms Patricia Forsythe (Harwin)  
 Ms Sylvia Hale  
 Mr Peter Primrose (Catanzariti)  
 Mr Henry Tsang

#### 2. **Inquiry into a sustainable water supply for Sydney**

##### ***Correspondence***

The Committee noted the following items of correspondence received:

- Letter from Mr Daryl McGregor, Albury Council, re the council's use of reclaimed water (received 10 April 2006)
- Letter from Mr Donald Hector, re papers provided to the Committee (received 21 April 2006)
- Letter from Mr Ken Grantham, Wyong Shire Council, re water supply network (received 26 April 2006)
- Letter from Senator Ian Campbell, Federal Minister for the Environment and Heritage (received 10 March 2006)

##### ***Answers to questions on notice***

The Committee noted the following answers to questions on notice received:

- Mr Robert Wilson (received 3 April 2006)
- Combined Community Groups of Sutherland Shire (received 7 April 2006)
- Department of Energy, Utilities and Sustainability (received 7 April 2006)
- Department of Planning (received 7 April 2006)
- Sydney Catchment Authority (received 7 April 2006)
- Sydney Water (received 10 April 2006)
- Albury Water (received 10 April 2006)
- Department of Environment and Conservation (received 13 April 2006)
- Gosford City Council (received 19 April 2006)

***Confirmation of minutes 54-56***

Resolved, on the motion of Ms Forsythe: That minutes 54-56 be confirmed.

***Consideration of Chair's draft report***

The Chair submitted his draft report which, having been circulated to each member of the Committee, was accepted as having been read a first time.

The Committee proceeded to consider the Chair's draft report in detail.

Chapter 1 read.

Chapter 2 read.

Resolved, on the motion of Ms Hale: That the introductory paragraph to Chapter 2 be amended by deleting the words 'Australia is the driest continent on earth. As a result ...'.

Resolved, on the motion of Ms Forsythe: That footnote 9 be amended to insert reference to the engineering work at the Warragamba and Nepean Dams to access deep water storage and the impact of the completion of this work on recorded storage levels.

Resolved, on the motion of Ms Forsythe: That paragraph 2.13 be updated to reflect information in the 2006 Metropolitan Water Plan.

Resolved, on the motion of Mr Donnelly: That paragraph 2.29 be amended by deleting the second sentence and inserting the following sentence:

It outlined new independent analysis which showed that Sydney is in a position to secure its water supplies in the face of severe drought and has more than enough water to meet its normal growth needs for at least the next ten years.

Resolved, on the motion of Mr Donnelly: That paragraph 2.30 be deleted and the following paragraph inserted:

In the Progress Report, the Government also committed to continuing the investigations into groundwater reserves to be used as a supply source in severe droughts. It also announced that it would not be necessary to raise the Tallowa Dam wall, but that additional water could be sourced from the Shoalhaven system by changing operational management of the Dam.

Resolved, on the motion of Mr Donnelly: That paragraph 2.31 be amended by deleting the first sentence and inserting the following sentence:

In response to the advice of the expert panel of Professor Stuart White of the Institute for Sustainable Futures at the University of Technology, Sydney and Mr David Campbell of ACIL Tasman, the Premier released the Metropolitan Water Plan 2006 on 8 May 2006.

Resolved, on the motion of Mr Donnelly: That paragraph 2.35 be deleted.

Resolved, on the motion of Mr Donnelly: That paragraph 2.36 be amended by deleting the words 'Given this responsibility, the Government has recently required 44 Councils in Sydney' and inserting the words 'As Councils in the Sydney region are major water users and managers, the Government has recently required them ...'.

Chapter 1 read again.

Resolved, on the motion of Mr Donnelly: That paragraph 1.13 be amended by deleting the words 'the NSW Premier, the Hon Morris Iemma MP' and inserting the words 'the former NSW Premier, the Hon Bob Carr MP'.

Chapter 3 read.

Resolved, on the motion of Mr Donnelly: That paragraph 3.1 be amended by deleting the words 'as a measure to increase Sydney's water supply' and inserting the words 'as a contingency measure in this or future droughts'.

Resolved, on the motion of Ms Forsythe: That the Committee secretariat include in the Glossary a summary of units of measurement of water and that reference to water volumes in the report be consistent wherever possible.

Resolved, on the motion of Mr Donnelly: That paragraph 3.121 be amended by deleting the last sentence.

Resolved, on the motion of Mr Primrose: That the following paragraph be inserted after Recommendation 4:

The Committee minority believes that the impact of seawater concentrate discharges on water quality and aquatic ecology was adequately addressed in the Environmental Assessment.

Resolved, on the motion of Ms Forsythe: That paragraph 3.124 be amended by deleting the words 'is of the view' and inserting the words 'heard evidence'.

Chapter 4 read.

Resolved, on the motion of Mr Colless: That if possible the Committee secretariat include in Chapter 4 additional information from the evidence of Professor Essery on water savings that could be achieved in Sydney.

Resolved, on the motion of Ms Forsythe: That paragraph 4.2 be amended to delete the word 'only'.

Resolved, on the motion of Mr Donnelly: That the following paragraph be inserted after paragraph 4.2:

By contrast, the 2006 Metropolitan Water Plan notes that 42% of water used in the household needs to be of potable quality (shower, kitchen, bathroom taps and dishwasher).

Resolved, on the motion of Mr Donnelly: That paragraph 4.4 be amended by deleting '2011' and inserting '2015', by deleting '65 billion' and inserting '70 billion' and by amending footnote 137 to refer to page 31 of the 2006 Metropolitan Water Plan.

Resolved, on the motion of Mr Donnelly: That paragraph 4.10 be amended by deleting the word 'revise' and inserting the word 'amend'.

Resolved, on the motion of Mr Donnelly: That the following new paragraph be inserted after paragraph 4.19:

However, the Committee also heard that opportunities to recover energy at Warragamba Dam are limited. The turbine at the dam, owned by Eraring Energy, is usually operated from full supply level to -0.3 metres (that is, only when the dam is spilling or close to spilling). Apparently, the turbine could be operated from the Warragamba pipeline even when dam levels are lower, but the discharge water goes to the Warragamba River, rather than back into the pipeline, so valuable drinking water would be lost to the system.

Resolved, on the motion of Mr Donnelly: That paragraph 4.46 be amended by inserting the following sentences after the first sentence:

Industry consumes only 12% of potable water in the Sydney region. Nonetheless, many industrial facilities can use recycled water, saving sizeable volumes of potable water.

Resolved, on the motion of Mr Donnelly: That paragraph 4.53 be amended by:

- deleting the words 'For example, AGL' and insert the words 'The evidence before the Committee from AGL is that it ...'
- deleting the words 'It is anticipated' and inserting the words 'AGL anticipates ...'
- deleting the words 'It is expected' and inserting the words 'AGL expects ...'.

Resolved, on the motion of Mr Donnelly: That paragraph 4.56 be deleted and the following paragraph inserted:

In the 2006 Metropolitan Water Plan, the Government announced its commitment to providing recycled water via dual reticulation systems for all new homes to be built in new suburbs in Sydney's North West and South West growth centres over the next 25 years. The Government has incorporated a provision in the draft State Environmental Planning Policy (Sydney Region Growth Centres) 2006 that requires developers to connect to a recycled water system, if one is available.

Resolved, on the motion of Mr Donnelly: That paragraph 4.68 be amended by deleting the words 'and that subsidies provided by Sydney Water to install a rainwater tank would encourage more householders to purchase one' and inserting the words 'under the Government's rebate program'.

Resolved, on the motion of Mr Donnelly: That paragraph 4.76 be amended to clarify the reference to 'the Department'.

Resolved, on the motion of Mr Donnelly: That paragraph 4.84 be deleted and the following paragraph inserted:

The 2006 Metropolitan Water Plan indicates that:

- Sydney has nearly 21,000 kilometres of pipes which carry water to households, businesses and government across Sydney, the Illawarra and the Blue Mountains.
- Around 18,000 kilometres of mains are being inspected for hidden leaks each year.
- Over the next four years, over \$400 million will be invested in these activities, including nearly \$100 million in 2005-2006.
- It is estimated that nearly 17 gigalitres of water per year is presently saved, with an estimate of around 33.5 gigalitres per year by 2015.

Resolved, on the motion of Mr Donnelly: That paragraph 4.92 be amended by deleting the words 'is to increase' and inserting the words 'was to increase', and by deleting the second sentence.

Resolved, on the motion of Mr Donnelly: That the following paragraph be inserted after paragraph 4.93:

The 2006 Metropolitan Water Plan notes that, in light of the analysis showing that this additional water is not needed for at least the next 10 years and in acknowledgment of the strong preferences of the Shoalhaven community, the Government has decided not to raise the Tallowa Dam wall. The plan noted that the Government is examining options for a modest increase in water transfers from the Shoalhaven without raising Tallowa Dam wall. A discussion paper will be released for community comment in mid-2006.

Chapter 5 read.

Resolved, on the motion of Mr Donnelly: That paragraph 5.18 be amended by deleting the first sentence and inserting 'As discussed in the previous chapters, industry consumes 12% of potable water in the Sydney region'.

Resolved, on the motion of Mr Donnelly: That paragraph 5.20 be amended by deleting the first sentence and inserting:

Mr David Evans, Managing Director of Sydney Water, advised the Committee that, after the drought has ended and the drought restrictions have been lifted, long term measures would be examined to continue the water conservation behaviours adopted during the drought:

Resolved, on the motion of Mr Donnelly: That the following paragraph be inserted after paragraph 5.33:

The first round of the Water Savings Fund opened in late 2005 and attracted more than 70 applications. In February 2006, offers totalling more than \$9.2 million were made to 27 water use efficiency and recycling projects. The second round was opened in March, with grants to be announced in the coming months. Two to three funding rounds will be held each year, involving a public call for applications.

Resolved, on the motion of Mr Donnelly: That paragraph 5.39 be amended by inserting the words 'residential dual reticulation' before the words 'water-recycling schemes'.

Resolved, on the motion of Mr Donnelly: That paragraph 5.44 be updated to reflect the content of the 2006 Metropolitan Water Plan.

Resolved, on the motion of Mr Donnelly: That paragraph 5.47 be updated to reflect the content of the 2006 Metropolitan Water Plan.

Resolved, on the motion of Mr Donnelly: That paragraph 5.53 be amended by deleting the words 'consumer organisations that come under government responsibility' and inserting the words 'organisations for which the Government has responsibility' and by deleting the second dot point.

Resolved, on the motion of Mr Donnelly: That paragraph 5.61 be deleted and the following paragraph inserted:

Sydney Water is examining the feasibility of requiring individual metering on new medium and high-rise buildings. This will become more important as the mix of new housing shifts from free standing houses to a higher proportion of strata units. Sydney Water is conducting a project to pilot individual unit metering. The pilot project includes the installation of individual water meters in two new multi-unit buildings; one building involves the manual reading of individual meters and the other uses internally installed data loggers and General Packet Radio Signal systems to remotely record the water usage.

Resolved, on the motion of Mr Donnelly: That paragraph 5.64 be amended by deleting the words 'is a significant consumer of water and' and inserting the words 'consumes 12% of Sydney's potable water, but ...'.

Mr Donnelly moved: That the following paragraphs be inserted before paragraph 5.65:

The Committee majority believes that drought restrictions are an important part of the Government's water plan for Sydney in drought periods. The majority agrees with the position in the 2006 Metropolitan Water Plan that people should be encouraged to continue commonsense and practical water conservation behaviours after the drought has ended, to save a significant amount of water each year.

The Committee recommends that the Government expands and diversifies its current community education campaigns to inform the community of the value of continuing commonsense and practical water conservation behaviours even in non-drought times.

Question put.

Committee divided.

Ayes: Mr Donnelly, Mr Colless, Ms Forsythe, Mr Tsang

Noes: Mr Cohen, Ms Hale

Question resolved in the affirmative.

Resolved, on the motion of Ms Hale: That paragraph 5.65 be amended by deleting the words 'The Committee believes' and inserting the words 'However, the Committee minority strongly believes...?.'

Resolved, on the motion of Mr Donnelly: That Recommendation 12 be deleted and the following Recommendation inserted:

That the Government expands and diversifies its current community education campaigns to inform the community of the value of continuing commonsense and practical water conservation behaviours even in non-drought times.

Mr Donnelly moved: That paragraph 5.66 be amended by deleting the second sentence and inserting the following sentence:

Accordingly, the Committee considers that it would be useful for the Independent Pricing and Regulatory Tribunal, in its next price path determination for Sydney Water, to consider a proposal that revenue from the sale of water over and above the water saving operating targets be allocated to the Water Savings Fund.

Question put and negatived.

Resolved, on the motion of Mr Colless: That paragraph 5.66 and Recommendation 13 be amended by inserting the words 'water saving' before the word 'operating'.

Resolved, on the motion of Mr Donnelly: That paragraph 5.68 and Recommendation 14 be amended by deleting the words 'Sydney Water' and inserting the words 'the Department of Planning'.

Resolved, on the motion of Ms Forsythe: That Recommendation 15 be amended to read:

That Sydney Water trial individual household water readings in high density housing, if possible in conjunction with simultaneous reading of gas and electricity meters, and that a cost benefit analysis of this trial be undertaken.

Resolved, on the motion of Ms Forsythe: That paragraph 5.72 be deleted and replaced with the following paragraph:

The Committee believes that Sydney Water should trial individual household water readings in high density housing, if possible in conjunction with simultaneous reading of gas and electricity meters, and that a cost benefit analysis of this trial be undertaken.

Chapter 6 read.

Chapter 7 read.

Resolved, on the motion of Mr Donnelly: That paragraph 7.10 be deleted and replaced with the following paragraphs:

The Shoalhaven Scheme operates as a drought reserve supply. It is activated when the total storage level of all the dams in the Sydney system falls below 60%. As part of its normal drought management response, Sydney has transferred a total of 939 gigalitres of water from the Shoalhaven River since 1980 as follows:

- August 1980 – November 1984: 430GL
- June 1994 – May 1995: 140GL
- April 2003 – March 2006: 397 GL

The transfers represent just over 3% of the total Shoalhaven River flow for this period. Since April 2003, the current drought has required pumping from the Shoalhaven River when sufficient inflows occur. From April 2003–March 2006, the Sydney Catchment Authority has transferred more than 397 gigalitres of water to Sydney's water supply dams from Tallowa Dam. This has contributed approximately 25% of Sydney's water supply over this time.

Resolved, on the motion of Mr Donnelly: That the following paragraphs be inserted after paragraph 7.17:

The Committee notes that these comments from members of the community reflect the strong community interest in ensuring the health of the lower Shoalhaven River. It notes that a wide range of scientific studies are currently being undertaken to increase understanding of the effects of releases from Tallowa Dam on the physical and ecological attributes of the lower Shoalhaven, and how these are likely to change in response to a different regime of river flows. These scientific studies, together with findings of past investigations, will be considered by technical experts to determine the most effective regime of environmental releases from Tallowa Dam for the benefit of the river.

The Committee notes that consultation on a new environmental flow regime for the lower Shoalhaven River is taking place through the Shoalhaven Community Reference Group. This Group includes representatives of the Southern Rivers Catchment Management Authority, Shoalhaven City Council and local indigenous, community, tourism, fishing and environment organisations. The Committee understands that the Government intends to release a discussion paper on the Shoalhaven Scheme in mid-2006 which will include options for the future environmental flows regime for Tallowa Dam.

Resolved, on the motion of Mr Donnelly: That Recommendation 16 be amended by deleting the words 'Sydney Water' and inserting the words 'the Department of Natural Resources'.

Resolved, on the motion of Mr Donnelly: That Recommendation 17 be amended by deleting the words 'Sydney Water' and inserting the words 'the Department of Natural Resources'.

Resolved, on the motion of Mr Donnelly: That paragraph 7.69 be amended by inserting the words 'the views of community members' after the words 'the Committee notes'.

Resolved, on the motion of Mr Donnelly: That paragraph 7.71 be deleted and the following paragraph inserted:

The Committee believes that the extraction of any additional water from Tallowa Dam should be based on peer reviewed scientific studies and not cause significant ecological harm to the lower Shoalhaven River.

Resolved, on the motion of Mr Donnelly: That Recommendation 18 be amended by deleting the words 'Sydney Water' and inserting the words 'the Department of Natural Resources'.

Resolved, on the motion of Mr Donnelly: That Recommendation 19 be amended by deleting the word 'install' and inserting the words 'undertake a cost/benefit analysis of installing ...'.

Resolved, on the motion of Mr Donnelly: That paragraph 7.74 be amended by deleting the second sentence and inserting the following sentence:

The Committee believes that the Government should undertake a cost/benefit analysis of installing renewable energy resources to match the amount of electricity used to transfer water from the Shoalhaven to the Nepean and Warragamba Dams.

Chapter 8 read.

Resolved, on the motion of Mr Donnelly: That the heading before paragraph 8.16 be amended by deleting the word 'current'.

Resolved, on the motion of Mr Donnelly: That paragraph 8.42 and Recommendation 20 be amended by deleting the words 'Sydney Water' and inserting the words 'the Government'.

Chapter 1 read again.

Resolved, on the motion of Mr Donnelly: That paragraph 1.14 be amended by deleting the first sentence and inserting the following sentence:

On 8 February 2006, during the course of the inquiry, the Premier, the Hon Morris Iemma MP, announced that construction of the desalination plant at Kurnell would only begin if dam storage levels dropped to 30%.

Chapter 3 read again.

Resolved, on the motion of Mr Primrose: That the following paragraph be inserted after Recommendation 2:

The Committee minority believes that the critical infrastructure designation is still needed, because it is important to ensure that the desalination readiness strategy is implemented as soon as possible, and that the necessary approvals are in place to enable any construction to be initiated in the event that dam levels fall to below about 30%.

Resolved, on the motion of Mr Donnelly: That paragraphs 3.115 and 3.116 be amended by deleting the words 'The Committee' and inserting the words 'The Committee majority'.

Resolved, on the motion of Mr Donnelly: That the following paragraph be inserted after paragraph 3.124:

On the other hand, the Committee also heard that opportunities for accepting and making use of waste water as part of the desalination plant may be limited. The proposed desalination plant contains a suite of treatment devices, including membranes, which are designed to remove particulate substances in a certain quality of input water. When the quality of input water is varied, the treatment system may produce a variable quality of potable water.

Chapter 5 read again.

Resolved, on the motion of Mr Donnelly: That the following paragraph be inserted after paragraph 5.62:

On IPART's recommendation, Sydney Water is implementing a program of assistance to those in economic hardship. Included in these measures are 'safety net' provisions, including free residential retrofits of water-saving appliances and a rebate of up to \$40 annually for large low-income families.

Executive Summary read.

### **3. Adjournment**

The Committee adjourned at 2.35 pm until a date to be determined.

## **Stephen Frappell**

Clerk to the Committee

## **Minutes No 58**

Wednesday, 7 June 2006

Room 1108 at Parliament House at 1.10pm

### **1. Members Present**

Mr Ian Cohen (Chair)

Mr Rick Colless (Deputy Chair)

Mr Tony Catanzariti (Primrose)

Mr Greg Donnelly

Ms Patricia Forsythe (Harwin)

Ms Sylvia Hale

Mr Henry Tsang

### **2. Substitute Members**

The Chair indicated that Mr Catanzariti would be substituting for Mr Primrose for the purposes of the meeting.

### 3. Inquiry into a sustainable water supply for Sydney

#### *Confirmation of minutes 57*

Resolved, on the motion of Ms Forsythe: That minutes 57 be confirmed.

#### *Consideration of Chair's draft report*

The Chair submitted his revised draft report which, having been circulated to each member of the Committee, was accepted as having been read.

The Committee proceeded to consider the revised Chair's draft report in detail.

Executive summary read.

Mr Donnelly moved: That paragraph 2 of the executive summary be amended by deleting the words 'disposing of it at sea has been' and inserting the words 'disposing it at sea or in the rivers around Sydney has been commercially,'.

Question put and negatived.

Mr Donnelly moved: That paragraph 2 of the executive summary be amended by inserting the words 'as the only means by which to maintain Sydney's water supply' at the end of the second sentence.

Question put and negatived.

Resolved, on the motion of Mr Donnelly: That the following paragraph be inserted after paragraph 15 of the executive summary:

Water planning for Sydney's future is now incorporating other options such as large-scale water recycling schemes, measures to conserve water in households and industry, greywater recycling in homes and reuse of stormwater.

Resolved, on the motion of Mr Donnelly: That the third sentence of paragraph 4 of the executive summary be amended by inserting the word 'majority' after the word 'Committee'.

Resolved, on the motion of Mr Donnelly: That paragraph 5 of the executive summary be amended by inserting the word 'majority' after the word 'Committee'.

Resolved, on the motion of Mr Donnelly: That paragraph 11 of the executive summary be amended by deleting the word 'low'.

Resolved, on the motion of Mr Donnelly: That paragraph 12 of the executive summary be amended by deleting the words 'stopped or'.

Chapter 3 read again.

Resolved, on the motion of Mr Donnelly: That paragraph 3.122 be deleted and the following paragraph inserted:

In relation to the issues of seawater concentrate discharges from the desalination plant, the evidence before the Committee from Dr Khan and Professor Sheikholeslami indicates that the EA includes insufficient information on the impact of the discharge on water quality and aquatic ecology.

Resolved, on the motion of Mr Donnelly: That the following new paragraph be inserted after Recommendation 5:

The Committee minority notes the technical difficulties associated with such a proposal and notes that the Government has recently announced a new scheme for use of wastewater with Kurnell industrial users.

Chapter 4 read again.

Resolved, on the motion of Mr Donnelly: That paragraph 4.3 be amended by deleting the words 'in a'.

Resolved, on the motion of Mr Donnelly: That paragraph 4.21 be deleted and the following paragraph inserted:

However, opportunities to recover energy at Warragamba Dam are limited. The hydro electricity plant at the dam, owned by Eararing Energy, is able to commence operation when Lake Burragorang rises to a level of minus one metre below full storage level (that is, it can operate only when the dam is spilling or close to spilling). Once water enters the plant, it is released into the Warragamba River and cannot be used as part of Sydney's drinking water supply.

Resolved, on the motion of Mr Donnelly: That paragraph 4.41 be amended by adding the following second sentence:

The exemption from council approval is only for the direct diversion of greywater for garden usage under certain conditions, which represents a very low risk undertaking in terms of health and environmental impacts.

Chapter 5 read again.

Resolved, on the motion of Mr Donnelly: That paragraph 5.45 be amended by deleting the words '1,500 gegalitres of water' and inserting the words '8.2 gegalitres of potable water'.

Resolved, on the motion of Mr Donnelly: That paragraph 5.67 be amended by deleting the word 'drought' and inserting the word 'water'.

Chapter 6 read again.

Resolved, on the motion of Ms Forsythe: That paragraph 6.15 be amended by deleting the word 'low'.

Chapter 4 read again.

Resolved, on the motion of Mr Colless: That paragraph 4.108 be amended by inserting the following sentence at the end of the paragraph:

This evidence would indicate that there is a total of 1,330 gigalitres of water available to Sydney each year.

Resolved, on the motion of Mr Tsang: That:

- the Chair's report (as amended) be the report of the Committee and be signed by the Chair and presented to the House in accordance with Standing Orders 230 and 231, together with the minutes, answers to questions on notice, transcripts, correspondence and tabled documents.
- pursuant to the provisions of section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* the Committee authorises the publication of all minutes, answers to questions on notice, correspondence, and tabled documents.
- the Committee Secretariat be permitted to correct typographical, stylistic and grammatical errors in the report prior to tabling.

Resolved, on the motion of Mr Colless: That the Committee secretariat circulate to the Committee the answers to questions on notice from the Department of Energy, Utilities and Sustainability.

#### **4. Adjournment**

The Committee adjourned at 2.00 pm until a date to be determined.

**Stephen Frappell**

Clerk to the Committee