Adopted

WaterPlan 2050

A long-term water supply strategy for the Central Coast

GOSFORD CITY COUNCIL
CENTRAL COAST

CENTRAL COAST

WYONG SHIRE COUNCIL

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Foreword

The Central Coast is a thriving community with a rich and diverse natural environment in which water plays a significant role.

At the time of developing this Strategy, the region was in the grip of the worst drought on record as a result of more than 15 years of below average rainfall and streamflows.

This has been the most severe period of such conditions and pushed the Central Coast's water supply system to its limits.

That is why Gosford City and Wyong Shire Councils, which manage the Central Coast's water supply system, took action to ensure we have sufficient water in the short-term as well as long into the future.

Key to this future planning has been the development of *WaterPlan 2050* which is the culmination of extensive technical studies and ongoing community involvement.

It sets out the strategy to secure and sustain our water supply system over the next 45 years.

The following pages outline the context in which *WaterPlan 2050* has been developed. It contains a combination of actions to:

- further enhance the current water supply system
- continue to use water as efficiently as possible
- develop additional future sources of water.

Gosford City and Wyong Shire Councils formally adopted *WaterPlan 2050* in July and August 2007. Implementation of the strategy is therefore now underway.

Current Situation

Existing Water Supply System

The majority of the Central Coast's town water supply comes from harvesting water flows from our four local streams – Wyong River, Ourimbah Creek, Mangrove Creek and Mooney Creek – along with Mardi and Mooney Dams.

Mangrove Creek Dam is our main water storage facility and provides back-up supplies for use during drought conditions.

Other key infrastructure includes three permanent weirs, two water treatment plants with a new one currently being built, 40 reservoirs and around 1900 kilometres of pipeline.

During the period of below average rainfall since the early 1990s, Mangrove Creek Dam has performed a vital role as a back-up source of water.

This has resulted in its storage levels being drawn down from around 70% in 1992 to just over 10% in early 2007.

Extended Drought

At the time of developing this strategy, the drought and ongoing period of below average rainfall was much more severe than any previous experience. In fact it is the worst since records began in 1885.

This resulted in average streamflows in our four rivers and creeks being reduced by about 50% over the previous 15 years compared to the long term average over the past 100 years – down from an annual average of 177,000 million litres to 83,000 million litres (see graph below).

2007 Rainfall

Rainfall during February-May 2007 steadily increased total dam storage levels on the Central Coast to about 15%. By May 2007 Mardi and Mooney Dams were each about 98% full, while Mangrove Creek Dam was about 10% full.

Severe storms during early June 2007 boosted total dam storage levels to about 22%.

Limited water could be pumped from our rivers during the June 2007 storms because Mardi and Mooney Dams quickly filled to capacity and there was no facility to pump from these smaller dams to Mangrove Creek Dam.

In May and June 2007 we pumped about 290 million litres of water from our rivers up to the Hunter region to be 'banked' for future use. No water was 'banked' following the June long weekend storms as the Hunter dams were also then full.

Demand for Water

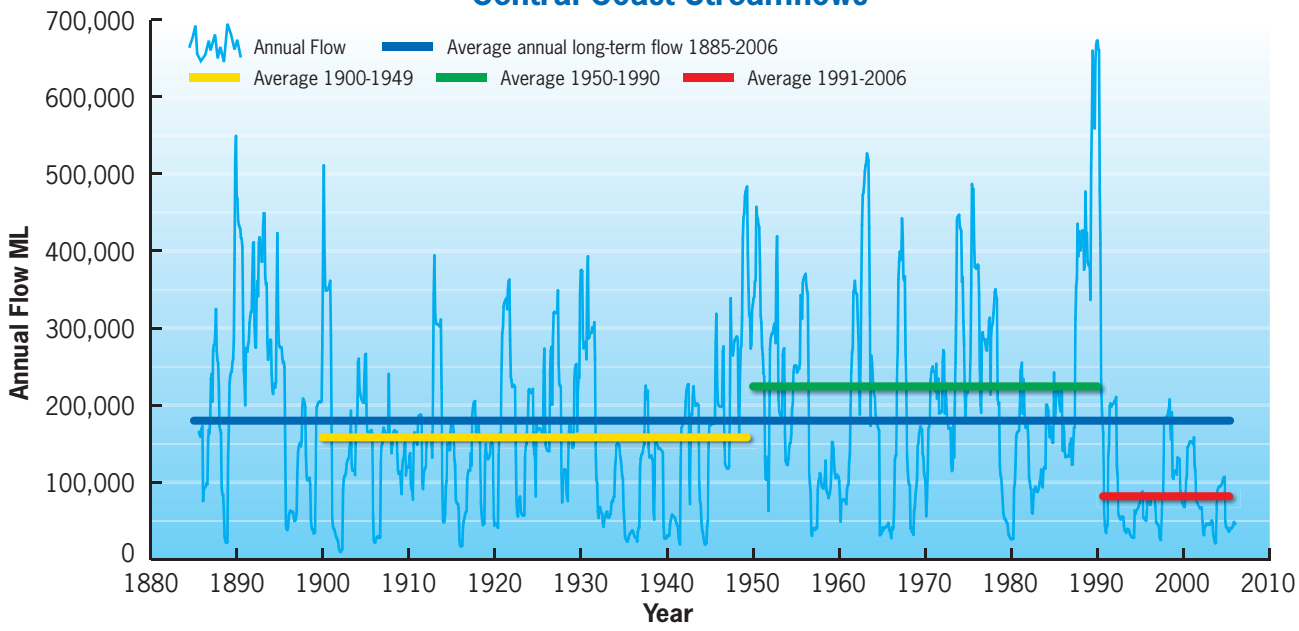
Demand for town water on the Central Coast on a per capita basis has been steadily falling since the 1980s. This follows the introduction of user pays pricing and community awareness of the need to conserve water.

This reduction, however, is offset by the Central Coast's growing population.

Based on State Government and Council estimates, the population of the region is expected to increase from about 295,000 in 2001 to around 465,000 by 2051.

Of total demand for water, around 70% comes from domestic users and the remaining 30% from non-domestic users.

Central Coast Streamflows



Managing the Drought

In response to the extended drought Gosford City and Wyong Shire Councils focused on the following key elements of our water supply system.

(i) System Upgrades

At the time of printing this strategy, the Councils had undertaken a comprehensive program of works to improve the efficiency of the water supply system and to enable more water to be extracted from our rivers when available. Major projects included:

- increasing the capacity of Wyong River pump station from 72 million litres to 125 million litres of water a day by October 2007
- building a new transfer system from Mardi Dam to Mardi Water Treatment Plant to increase its capacity from 100 million litres to 240 million litres a day by November 2008
- building a new 160 million litres a day high lift pumping station at Mardi Dam by June 2008
- raising Mardi Dam wall to increase its storage capacity from 7,400 million litres to 8,800 million litres by May 2008
- building a connection from lower Mangrove Creek weir to Mooney Mooney Dam to enable the transfer of surplus water for storage by June 2007.

A number of interim actions were also undertaken to increase the amount of water available in the system by building a temporary weir on Porters Creek, raising Mangrove Creek weir and reducing environmental flows on Ourimbah Creek.

(ii) Reducing Demand

To encourage everyone to use water as efficiently as possible to reduce overall usage, a comprehensive demand management program has been

implemented since February 2002 which includes the following key elements:

- increasingly stringent water restrictions including mandatory Water Management Plans for large water users
- extensive community education program (including dedicated schools program) to inform people about how they can use water more efficiently
- provision of rebates for installation of rainwater tanks, water efficient washing machines and greywater treatment systems
- provision of subsided REFIT kit that includes water efficient shower head, tap aerators and toilet cistern weight
- increased use of rainwater, stormwater, non-drinking groundwater and treated wastewater for irrigation of sports grounds, parks, median strips, and to flush public toilets, fill tankers and roadworks
- active leak detection and water pressure management program
- actions to significantly reduce the amount of water used by Gosford City and Wyong Shire Councils.

These actions helped reduce demand for town water across the entire water supply system by 39% over five years. This is down from a daily average of 100 million litres in early 2002 to 61 million litres in April 2007.

(iii) Accessing More Water

The Councils also introduced additional sources of water to boost supplies including:

- construction of the $37 million Hunter Connection which can deliver an annual daily average of 30 million litres of treated drinking water
- development of seven groundwater bore fields across the Central Coast to generate around nine million litres of drinking water a day.

Investigations have also been carried out into the use of temporary mobile desalination units to provide up to 20 million litres of drinking water a day as a last resort if climatic conditions worsen.

Planning Our Future

The Central Coast's water supply system was built over many decades with significant expansion since the 1960s. Over the past four decades improvement works have been ongoing in response to population growth, new technology, variable climate conditions and changing government regulations.

As part of this process, and in addition to the drought management works, Gosford City and Wyong Shire Councils have been developing a long-term strategy to ensure the effective management of the Central Coast's water supply system for the next 45 years.

The strategy seeks to identify medium to long-term changes and improvements that can be progressively introduced over time to:

- achieve a safe, reliable and secure water supply that meets community needs
- ensure the supply and use of water is efficient and affordable
- protect the health of our rivers and creeks as well as the general environment.

In developing this strategy, now known as *WaterPlan 2050*, the two Councils have considered:

- the existing water supply system
- current available sources of water
- demand for and use of town water
- water conservation and people's changing attitudes to water
- local hydrology and climatic conditions.

In addition, the Councils undertook extensive modelling and analysis to assess:

- future impacts of varying climate conditions
- likely system yields and overall performance of the water supply system
- possible future water sources
- likely demand for town water, in particular drinking water
- population growth and growth patterns
- regulatory and policy changes including the future cost of water
- social and environmental impacts
- the potential benefits/opportunities of emerging new technology.

The Councils also worked with a *WaterPlan 2050* Community Liaison Group to discuss community views and ensure a community perspective was a key part of developing a long-term approach to managing our water supply.

Additional community consultation was also undertaken before this final *WaterPlan 2050* strategy was adopted (see Appendix A for details).

WaterPlan 2050 Strategy

Key Objectives

The key objectives of *WaterPlan 2050* are to:

- deliver early benefits by further improving the existing water supply system and gradually easing water restrictions
- continue to change the way people value and use water
- maintain flexibility and opportunities for future generations so they can effectively meet their water needs.

No single action, by itself, is considered to be the ideal solution. Rather, a mix of actions should be implemented over time so we can adapt and respond to circumstances as they continue to change and evolve.

These actions can be categorised into three key areas:

(i) Enhancing the existing water supply system

(ii) Using water efficiently

(iii) Accessing additional sources of water.

(i) Enhanced Water Supply System

Link Mardi Dam to Mangrove Creek Dam

To enhance the existing water supply system, a 21-kilometre pipeline will be built linking Mardi and Mangrove Creek Dams, together with two new pump stations. One pump station will enable water to be transferred between the two dams, the other will increase water extractions from Wyong River.

This additional water will be harvested from Wyong River and Ourimbah Creek during medium and high flows and temporarily stored in Mardi Dam before being pumped through to Mangrove Creek Dam.

When required, spillway gates will be constructed on Mangrove Creek Dam to increase its storage capacity from 190,000 million litres to 230,000 million litres.

It is estimated the Mardi-Mangrove Link project could be completed by the end of 2010, subject to NSW Government regulations and approvals. The anticipated timeframes aim to allow sufficient time for the necessary planning, design, construction and regulatory processes to be completed as well as ongoing community consultation.

The Federal Government has committed $80 million towards the project through the National Water Commission.

The new Mardi-Mangrove Link is considered to provide the quickest drought recovery time compared to other possible options. The aim is to get the region's total dam storage levels back up to a level whereby water restrictions could be eased.

The key benefits of this project include:

- harvesting more water for town use from Wyong River and Ourimbah Creek during medium and high flows
- ability to increase storage levels of Mangrove Creek Dam using excess water from Wyong River and Ourimbah Creek
- enhanced environmental flows in Wyong River during low and medium streamflows
- good integration with current and future elements of the Central Coast's water supply system.

The extraction of water from our rivers and creeks is regulated and licensed by the State Government.

Water Sharing Plans are prepared by the State Government to ensure water is shared fairly between environmental needs and water users including town supply, rural domestic supply, stock watering, industry and irrigation.

Access licenses are issued to the two Councils based on these Water Sharing Plans. They are therefore a key consideration as to the amount of water we will be allowed to harvest in the future.

Detailed environment assessments would be undertaken as part of the overall project to help ensure the long term health of our rivers and creeks.

Tillegra Dam

The NSW Government's proposed new 450,000 million litre dam at Tillegra, if built, could provide longer term benefits for the Central Coast's water supply system.

This new dam would help ensure the security of water transfers between Hunter Water and the Central Coast in the longer-term which are an important part of the *WaterPlan 2050* strategy.

The two Councils will therefore investigate possible yield and cost options with the State Government to ensure that any potential benefits to the region's water supply system can be optimised.

The main issues to be considered in relation to this project are:

- the earliest that Tillegra Dam could be completed is 2013. Additional time will then be needed for it to reach an acceptable storage level
- any difficulties in obtaining the required regulatory approvals could delay the project beyond 2013
- accurate costs for the dam construction are not yet known which means any potential cost sharing arrangements cannot yet be determined
- arrangements will need to be carefully analysed to ensure they deliver value-for-money to the Central Coast.

The Central Coast Water Supply System

(ii) Efficient Water Use

Efficient water use is a simple and cost effective way to help ensure our water supply system into the future. Drinking water is too valuable a resource to be wasted.

By not wasting water and using it as efficiently as possible we can reduce overall demand for town water and increase the longevity of our water resources.

A key part of *WaterPlan 2050* is to encourage people to implement water conservation as a part of their everyday lives to achieve a sustainable reduction in demand compared to pre-restriction water usage.

This will be achieved by:

- inclusion of mandatory water efficiency requirements for the building of new homes, businesses and other developments
- increased uptake of water efficient appliances assisted by the provision of Council rebates and industry water efficiency labelling schemes
- ongoing retrofitting of water efficient devices in homes and businesses
- continued community education to achieve permanent changes in how people use and value water
- continued use of mandatory Water Management Plans for businesses and organisations using more than 3.5 million litres of water a year to ensure water efficiency
- continued active leak detection and repair programs to help further improve the overall efficiency of the water supply system
- continued water pressure reduction and management programs to help further reduce medium to long-term demand for town water
- further implementation of cost effective stormwater harvesting projects to generate additional water for non-drinking purposes such as irrigation of parks and sporting facilities
- additional recycled wastewater projects for non-drinking purposes such as irrigation, public toilet flushing and distribution to industrial users and businesses.

iii) Additional Water

Hunter Connection

The two Councils will continue to transfer water between Hunter Water and the Central Coast via the pipeline connection until our total dam storages have sufficiently recovered.

The timeframe for this will depend on climate conditions, the rate of drought recovery and demand for town water.

After the Central Coast recovers from the current drought the two-way link will remain a key measure to effectively manage the supply of water between the two regions.

Groundwater

Groundwater will continue to be accessed from the Central Coast's seven borefields to boost drinking water supplies until our total dam storages have recovered to an appropriate level.

Groundwater will then remain as a reserve source of water that can be called upon in the event of severe and prolonged drought conditions in the future.

Retrofitting Rainwater Tanks to Existing Dwellings

The use of rainwater tanks provides a further opportunity for the community to be part of *WaterPlan 2050*. Individual households, businesses and other organisations can capture and store rainfall for use in and around their premises, thereby reducing the amount of town water they may use.

The Councils will continue to encourage the retrofitting of rainwater tanks to existing buildings by offering rebates, with additional incentives for internally connected tanks.

Further rebates are also offered by the NSW Government as an additional incentive.

The key benefits of installing rainwater tanks include:

- reduced demand for town water
- maximising the capture of coastal rains
- reduced extractions from the region's rivers and streams to meet demand for town water
- reduced stormwater discharges from residential areas which will help deliver stormwater management efficiency improvements.

Key factors that could impact the effectiveness of this program include:

- willingness by individual residents and businesses to install and maintain rainwater tanks over the long-term
- variations in the amount of water that can be saved due to differences in roof and tank size, as well as how the rainwater tank is connected
- affordability of installing rainwater tanks (*WaterPlan 2050* assumes an average cost of $3,000 per internally connected tank)
- the NSW Government discontinuing its rebates for rainwater tanks in the long-term once the Central Coast has recovered from the drought.

Possible Future Supply Enhancements

Any strategy that extends over 40 years into the future must be both flexible and adaptable.

That is why *WaterPlan 2050* is based on a staged approach to increase our overall water resources to ensure supply always exceeds demand over the next 45 years.

Building the link between Mardi and Mangrove Creek Dams will help to access more water and make our supply system more effective and sustainable in the future, especially during years of above average rainfall.

If, however, there is further deterioration in climate conditions, with prolonged below-average rainfall, then more water may still be needed to meet demand.

In these conditions, based on the Councils' current modelling and investigations, the most feasible sources of additional water would be highly treated recycled water and desalinated seawater.

Neither of these options depend on rainfall which is why they have been retained as potential future water sources within *WaterPlan 2050*.

Recycled Water

Further investigations will be undertaken into the use of highly treated recycled wastewater as a possible future water source.

If needed, this water could be used in a number of ways including to substitute flows for environmental purposes in Wyong River, downstream of the weir, so that more water could be extracted upstream to boost drinking water supplies.

Alternatively it could be added to our dams to boost overall water supplies. This approach would be pursued only after extensive technical research and sufficient community support and acceptance.

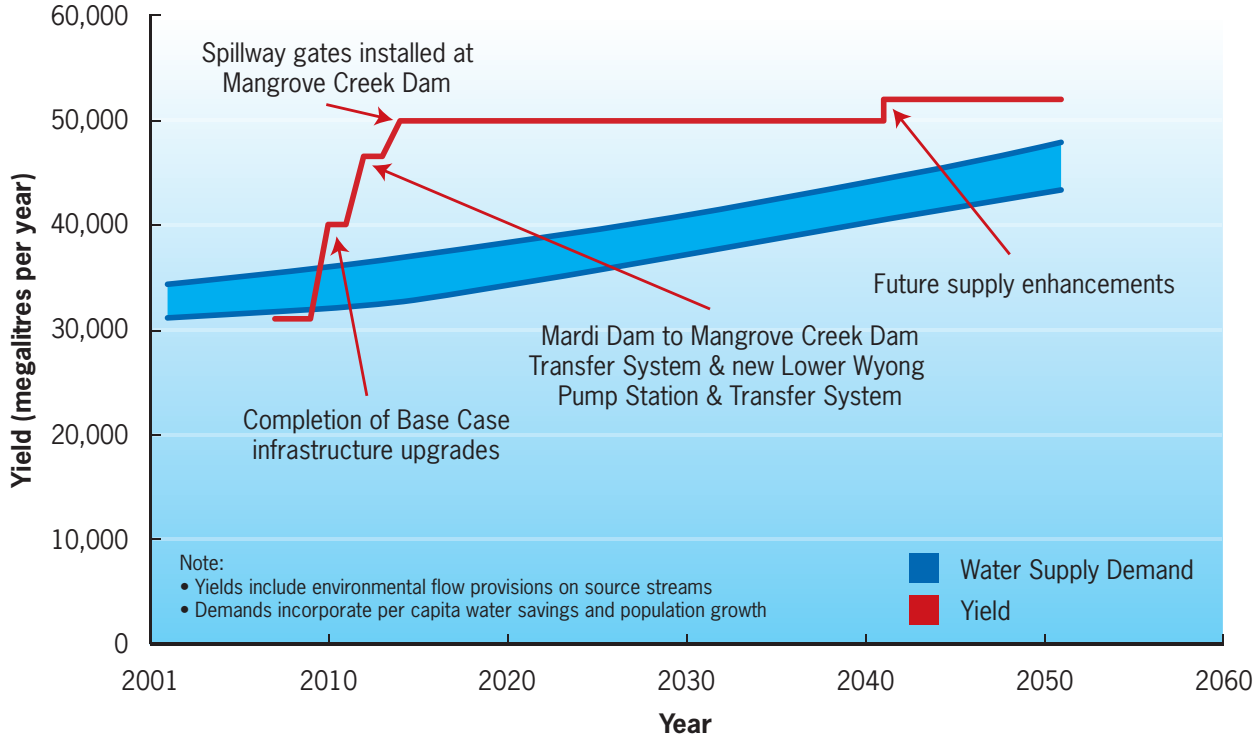
The other key challenge is that, as at mid-2007, there are no State or Federal Government policies or guidelines that allow highly treated recycled wastewater to be used to supplement drinking water.

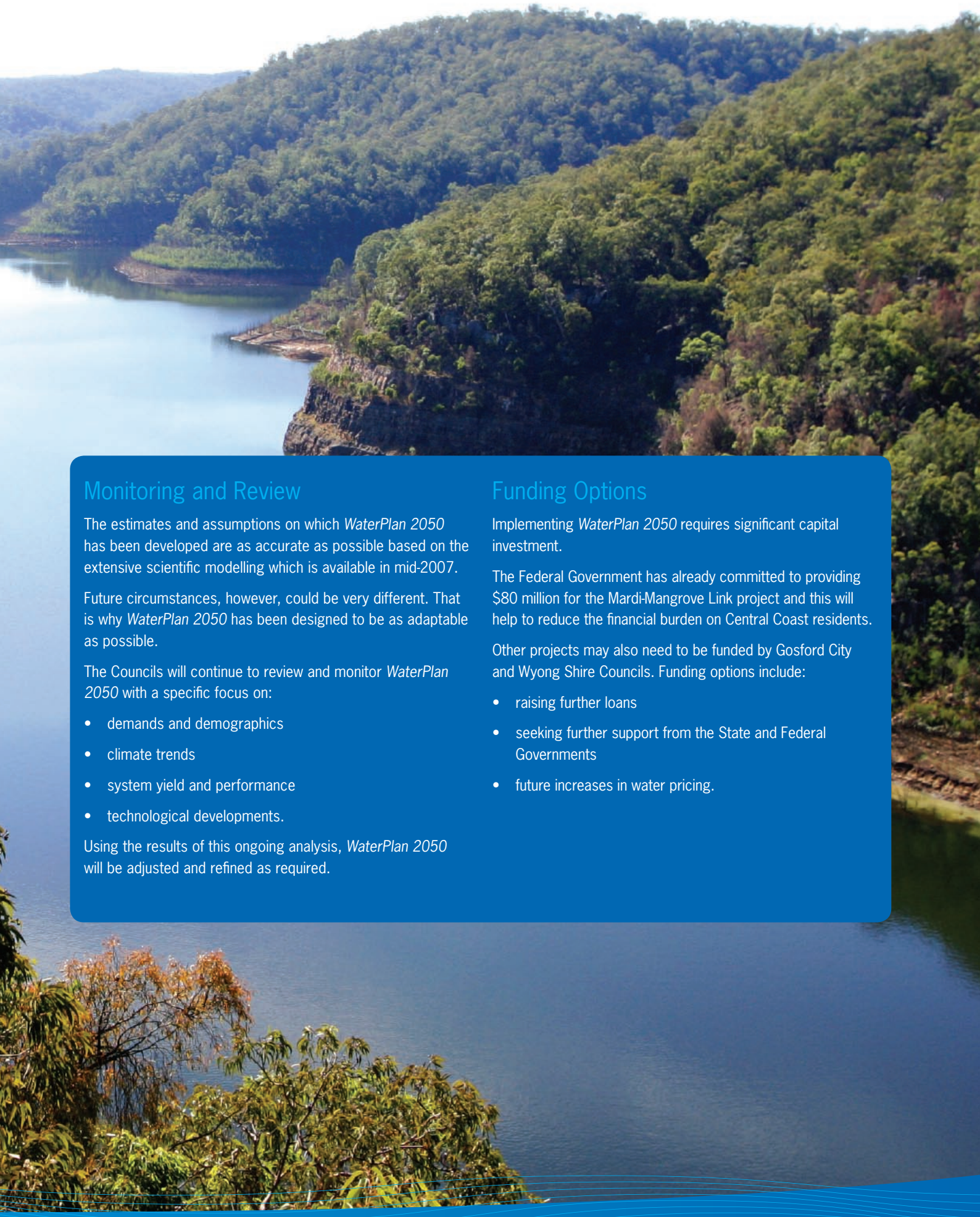
Permanent Desalination

Permanent desalination will be retained for potential use during future prolonged drought conditions or to meet future significant increases in demand for town water.

Development consent was sought from the State Government for a 20 million litres a day plant so it could be constructed in an appropriate timeframe should it be needed over the next 45 years. The State Government granted conditional approval for the plant in July 2007.

Staged Water Supply Increases





Monitoring and Review

The estimates and assumptions on which *WaterPlan 2050* has been developed are as accurate as possible based on the extensive scientific modelling which is available in mid-2007.

Future circumstances, however, could be very different. That is why *WaterPlan 2050* has been designed to be as adaptable as possible.

The Councils will continue to review and monitor *WaterPlan 2050* with a specific focus on:

- demands and demographics
- climate trends
- system yield and performance
- technological developments.

Using the results of this ongoing analysis, *WaterPlan 2050* will be adjusted and refined as required.

Funding Options

Implementing *WaterPlan 2050* requires significant capital investment.

The Federal Government has already committed to providing $80 million for the Mardi-Mangrove Link project and this will help to reduce the financial burden on Central Coast residents.

Other projects may also need to be funded by Gosford City and Wyong Shire Councils. Funding options include:

- raising further loans
- seeking further support from the State and Federal Governments
- future increases in water pricing.

Appendix A – Community Consultation

A number of community consultation phases were undertaken during the development of the *WaterPlan 2050* strategy.

These included focus group meetings, community presentations, media advertising, fact sheets, community surveys and the establishment of a Community Liaison Group.

It also involved the public exhibition of two *WaterPlan 2050* documents – a Preliminary Working Draft and a Recommended Strategy.

These communication and consultation activities aimed to keep all key stakeholders informed and involved in the future planning of our Central Coast water supply system.

Community Liaison Group

A dedicated *WaterPlan 2050* Community Liaison Group (CLG) was formed in early 2004 to help provide a community perspective on planning for the future of the Central Coast water supply.

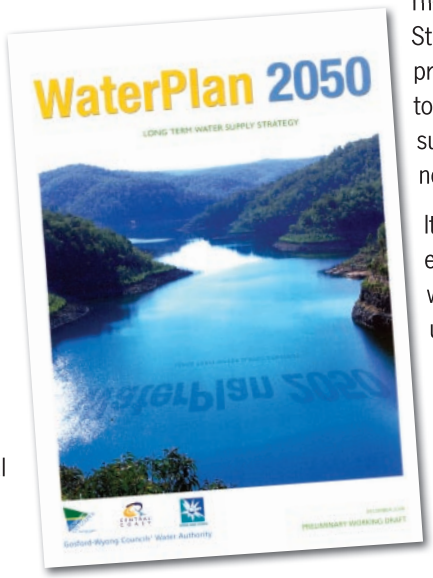
The CLG comprised community members, community group representatives, State Government agency staff and Gosford City and Wyong Shire Councils staff. The group met monthly until mid-2005.

The CLG advised that a future plan for the Central Coast Water Supply system should be environmentally sustainable, adaptable, regularly reviewed, and involve sustainable water usage by businesses and residents.

Advice and input from the CLG was considered as part of this strategy along with other community and stakeholder input.

Public Exhibition of Preliminary Working Draft

In 2006 Gosford City and Wyong Shire Councils prepared a Preliminary Working Draft of *WaterPlan 2050*. This document was based on the extensive modelling and analysis which had been undertaken by the Councils, including work done during the drought.



The Preliminary Working Draft provided 10 possible options to help secure the water supply system over the next 45 years.

Each option was reviewed to assess how much additional water could be harvested, potential drought recovery times, likely costs, benefits, challenges and environmental and social impacts.

The Preliminary Working Draft of *WaterPlan 2050* was placed on public exhibition for two months between December 2006 and February 2007. A total of 56 submissions were received from individual community members and interested organisations.

Submissions indicated that the community generally supported the Councils' approach to *WaterPlan 2050*. Respondents favoured the demand reduction measures, continued use of recycled water for non-drinking purposes, the plan to link Wyong River and Mardi Dam to Mangrove Creek Dam, and the retrofitting of rainwater tanks.

These submissions, along with further expert technical input, were considered in developing the next stage of the process, a Recommended Strategy.

Public Exhibition of Recommended Strategy

The Recommended *WaterPlan 2050* Strategy was developed using the community, stakeholder and technical feedback from the Preliminary Working Draft.

The Recommended Strategy featured a proposed roadmap to manage our water supply system over the next 45 years.

It focused on plans to enhance the existing water supply system, use water efficiently, and access additional water sources.

The Recommended *WaterPlan 2050* Strategy was placed on public exhibition for six weeks during May and June 2007. The document received 20 submissions from the public.

These submissions indicated general support and acceptance of the Recommended Strategy, particularly for the Mardi-Mangrove Link project, for the ongoing need for demand management, and also for further water recycling and stormwater harvesting.

The Recommended Strategy was formally adopted by Wyong Shire Council on 25 July 2007 and by Gosford City Council on 7 August 2007.

The resolution also stated that the adopted *WaterPlan 2050* strategy be regularly monitored and formally reviewed at least every five years.

The document you are reading is the finalised *WaterPlan 2050* strategy.

Appendix B – Options Not Being Pursued

The preliminary working draft of *WaterPlan 2050* contained 10 possible actions to secure a long-term sustainable water supply for the Central Coast.

Four of these options will not be pursued at this time but will remain available for future generations to consider as appropriate.

The decision not to pursue these options is based on feedback from the community and Councillors as well as further technical reviews of the specific benefits, challenges, costs and estimated increases in yield.

The options not being pursued include:

Upper Wyong River to Mangrove Creek Dam Transfer System

This option included transferring water from the upper Wyong River to Mangrove Creek Dam to supplement run-off from the dam's catchment.

This would require a new weir that would affect more than 20 kilometres of the river downstream. To that end, the environmental impact of this was considered to be unacceptable.

This option only provides for water extraction from about one third of the Wyong River catchment and is therefore less favourable than the recommended option that provides for water extraction from almost the whole Wyong River catchment.

Lower Mangrove Creek to Mangrove Creek Dam Transfer System

This option was based on modifications to existing infrastructure to allow excess flows in Mangrove Creek during rainfall events to be 'banked' in Mangrove Creek Dam.

This is likely to be impacted by future changes to State legislated environmental flow rules that have yet to be released.

Overall, the project would also have a significant impact on the environment along the Mangrove Creek Valley because of the need to construct a 17.5 kilometre access road.

Toobys Creek Off-stream Storage

This option involved the construction of an off-stream storage facility at Toobys Creek. Water harvested from the lower Wyong River and Ourimbah Creek during high flows could be stored for use at a later date.

Overall, it is estimated that the environmental impact of this option was unacceptable as it would result in the loss of more than 100 hectares of forest combined with significant changes to streamflows, fishways and river bed movements in Toobys Creek.

MacDonald River to Mangrove Creek Dam Transfer System

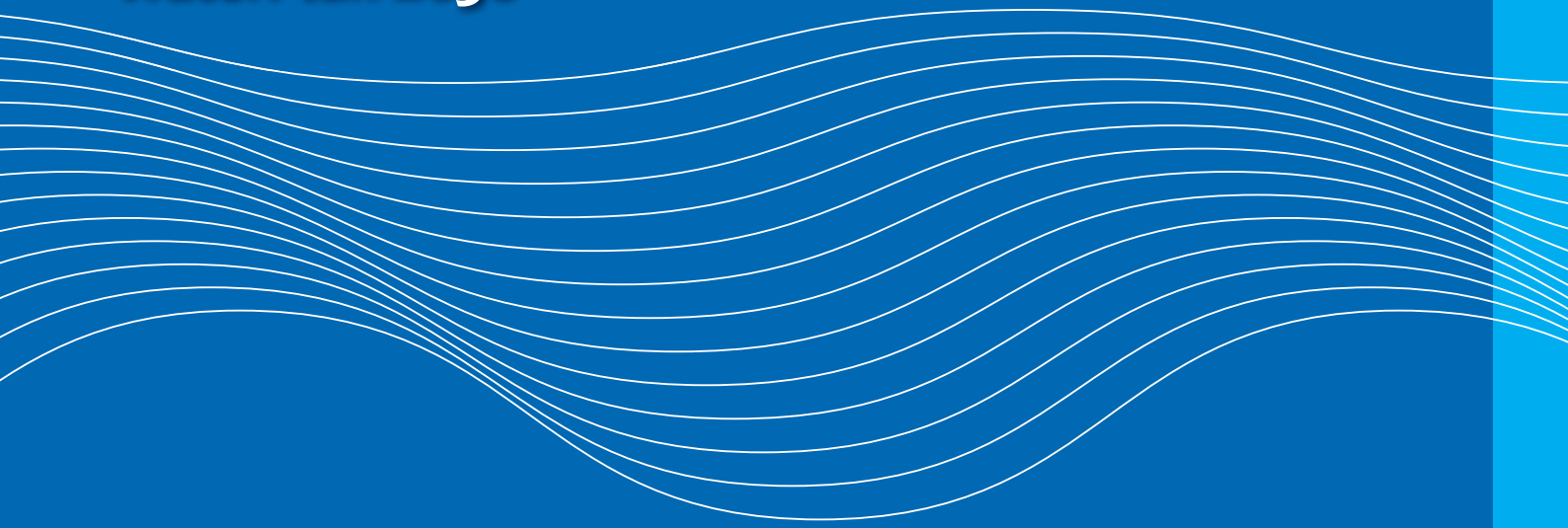
This option included the transfer of water from MacDonald River to Mangrove Creek Dam and was based on assumptions resulting from studies in 1985 about median annual flow of the MacDonald River providing up to 185,000 million litres a year.

More recent analysis of potential flows, based on monitoring equipment installed in the 1990s, indicate that actual flows may be as little as 50,000 million litres a year.

Although the catchment area of the MacDonald River is much larger than Wyong River, the annual flow of both water sources is estimated to be very similar. The MacDonald River flow data is distorted by the occasional flood event.

Other challenges associated with this option include unacceptable environmental impacts on mainly farming land and areas in Yengo National Park, some of which are recognised as Aboriginal heritage sites of cultural significance.

WaterPlan 2050



WYONG SHIRE COUNCIL

Gosford City Council (02) 4325 8222
www.gosford.nsw.gov.au

Wyong Shire Council (02) 4350 5555
www.wyong.nsw.gov.au

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