Department of Primary Industries
Office of Water

Menindee Lakes water savings opportunities – information paper

April 2012

Introduction

The Menindee Lakes water storage scheme is a complex system in far-west New South Wales. The scheme was built for water storage, and whilst this is still its primary purpose, it is now managed as a multi-purpose resource.

The Menindee Lakes also has high environmental and cultural values and is a focus for tourism and recreation in far-west of the State.

Not only is the management of the lakes complex in its own right, but it is also part of the equally complex water sharing arrangements of the Murray-Darling Basin Agreement.

Everyone who has ever heard of the Menindee Lakes seems to have an opinion as to how the lakes should be managed and typically, the opinions expressed reflect particular interests and perspectives.

The purpose of this paper is to give a brief overview of the Menindee Lakes, how they are currently managed, and how management and operations need to consider a complexity of issues.

Importantly, the paper outlines the reasons the NSW Government does not support the changed operations of the lakes proposed by the Commonwealth Government, that was recently the subject of a Memorandum of Understanding between the Commonwealth and NSW Governments.

The Menindee Lakes storage scheme

The Menindee Lakes storage is a series of nine natural lakes, part of the Travellers Lake System adjacent to the Darling River in far-west NSW.

In the early 1950s and 1960s, the NSW Government constructed the Menindee Lakes water storage scheme by connecting the natural lakes and Darling River by a series of weirs, regulators, inter-connecting channels and levees.

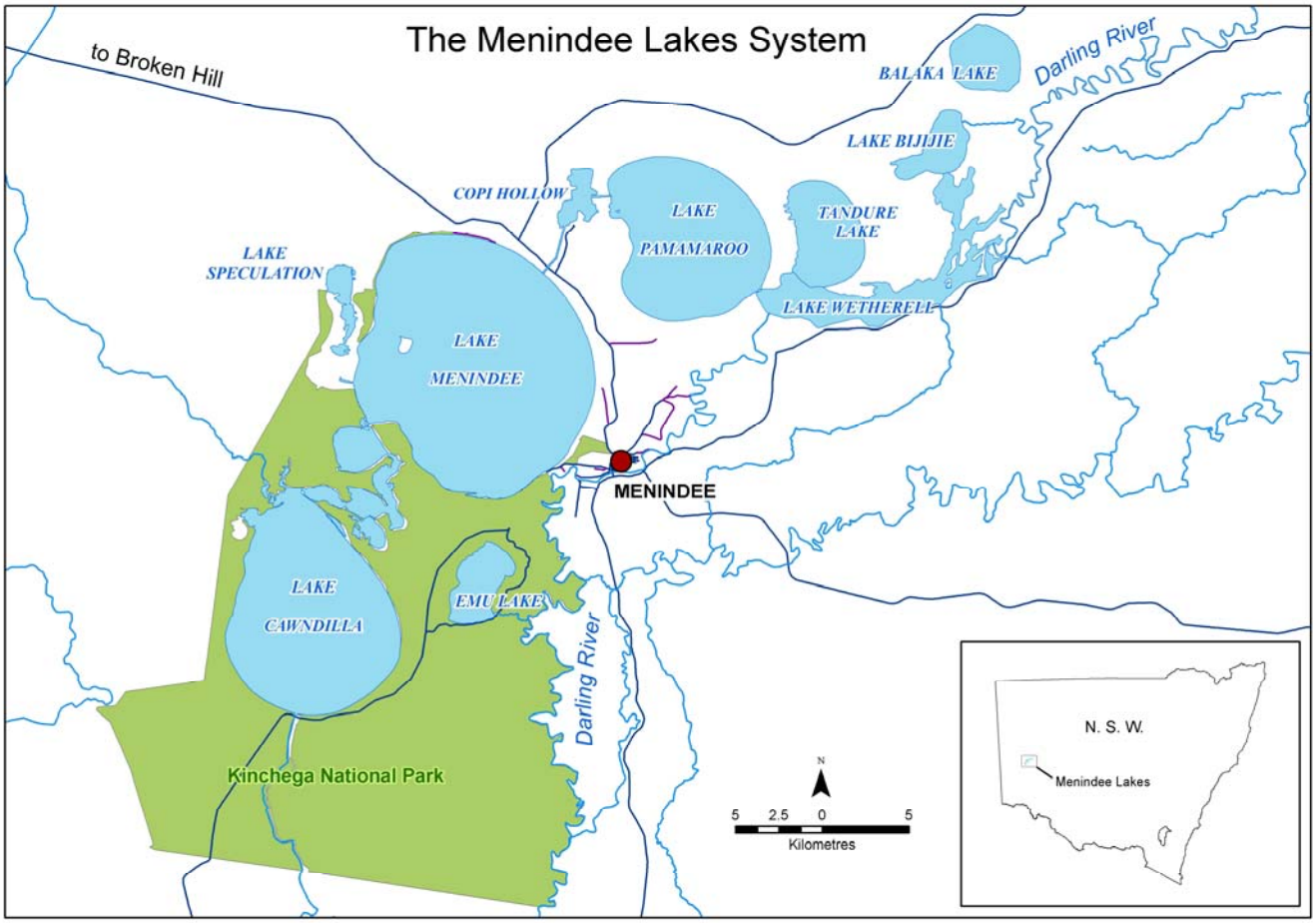
When full, the storage scheme has a surface area of 453 square kilometres and stores 1,731,000 megalitres at full supply level.

It is also one of only two storage systems in inland NSW that can be surcharged during floods, although levels must be reduced to full supply level as soon as possible after the peak of the flood has passed.

The initial purpose of the storage scheme was to secure water supply for Broken Hill and to foster economic development in far-west NSW through irrigation. The lakes have subsequently been used to supply water to Victoria and South Australia under the Murray-Darling Basin Agreement.

The Menindee Lakes scheme is owned and maintained by the NSW Government.

Each year the Murray-Darling Basin Authority pays NSW $320,000 and three-quarters of the costs of operations and maintenance.



How the scheme works

The Menindee Lakes water storage scheme is a complex system of natural lakes in a semi-arid and flat environment. Most water storages in upstream catchments consist of a dam across a river, which simply allows flows to be impounded and subsequently released for downstream use. This increases the reliability and security of water supply in a variable environment.

By comparison, the Menindee main weir raises the level of the Darling River by 14 metres which inundates the floodplain upstream of the main weir and connects the smaller lakes - Malta, Balaka, Bijiji and Tandure with the Darling River. The floodplain is confined on the eastern side by a constructed levee. Collectively, the inundated floodplain and connected lakes is called Lake Wetherell.

Water from Lake Wetherell can be released directly to the Darling River via an outlet regulator or through the main weir; alternatively water from the lake can be diverted via gravity into Lake Pamamaroo.

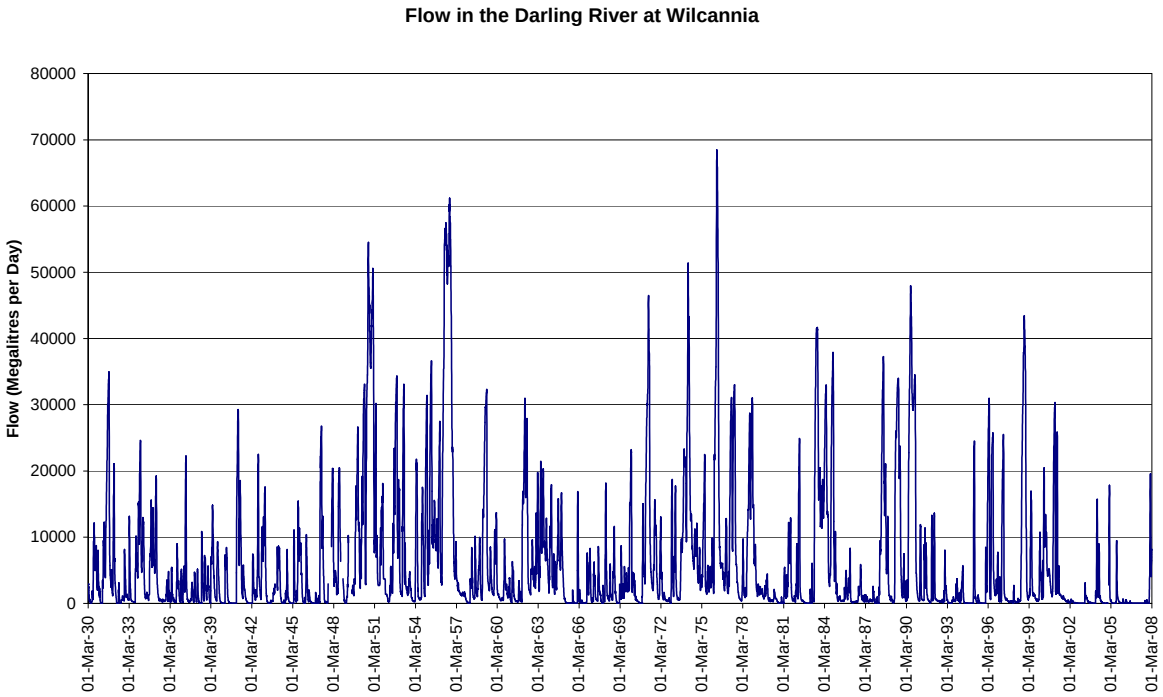
Water from Lake Pamamaroo can then be released back to the Darling River through an outlet regulator or passed into Lake Menindee via a constructed interconnecting channel.

Water from Lake Menindee will pass naturally into Lake Cawndilla when the level exceeds the natural sill between the two lakes. Water from Lake Menindee can also be diverted to the Darling River.

Water from Lake Cawndilla can be diverted back to the Darling River through Lake Menindee when the level exceeds the natural sill level between the lakes, or can be directed through an outlet regulator and channel to Tandou Creek and subsequently onto the Great Anabranch.

Flow variability

Flows in the Darling River are amongst the most variable of any river in the world, and at the Menindee Lakes the drought and flood cycles are more distinct than in any other part of NSW.



This graph shows 50 years of extreme variability in Darling River flows. Note: the periods of almost no flow from 2006 to March 2008

Looking down stream at remnant pools of water during nil flow down the Darling River at Tulney Point 14 Jan 2008 and the same spot during high flows 3 April 2012. Photo courtesy Rachael Strachan

Located in a semi-arid environment subject to highly variable flows, the Menindee Lakes are also subject to high evaporation rates. On-average, 425,000 megalitres is lost from the Menindee Lakes through evaporation each year. This compares with 745,000 megalitres which is lost from the Lower Lakes in South Australia through evaporation each year.

Meeting expectations

These complexities and the need to consider a range of issues and values makes management of the Menindee Lakes both interesting and difficult. It also leads to various and diverse opinions as to how the lakes should be managed differently to meet, or enhance different outcomes.

Murray-Darling Basin Authority chairman, Craig Knowles, was recently quoted in the *South Australian Stock Journal* saying that; "…too much water is stopped from flowing to South Australia by the Menindee Lakes."

This, if taken in its simplest context would reflect a single outcome of getting more water down to South Australia by reducing the water storage capacity of the lakes, but fails to recognise the other value of the lakes that includes securing water supply to downstream users in drought, not just in NSW, but in Victoria and South Australia.

When water availability was reduced in the Murray Valley during the recent prolonged drought, the Menindee Lakes provided valuable reserves that were used to supply water users along the Murray River, including into South Australia.

In addition to this, in 2009-2010 the NSW Government agreed to allow over 580,000 megalitres to pass through Menindee Lakes to meet the immediate environmental needs of the Lower Lakes in South Australia.

This water would otherwise have been stored in the Menindee Lakes to increase water availability to NSW and Victorian irrigators.

In most years, water from the Menindee Lakes provides a significant proportion of South Australia's entitlement flow and additional dilution flow when water is either transferred for storage in Lake Victoria or released directly for use in South Australia.

This is necessary as natural constraints on the Murray River, including the Barmah Choke near Echuca, limit the amount of water able to be delivered to meet peak daily demands in NSW, Victoria and South Australia during summer.

The value of the Menindee Lakes as a vital water storage for all three states will only increase under the CSIRO climate change predictions that show increased dry periods and reduced water availability in the south of the Murray-Darling Basin. This means that capturing and storing water from the north of the Basin in the Menindee Lakes to secure water supply for downstream users, including in South Australia, will become increasingly important

Some recent suggestions that water from the north of the Murray-Darling Basin never finds its way past the Menindee Lakes are clearly inflammatory.

Between October 2010 and May 2011 over 4.7 million megalitres was released from the Menindee Lakes to the Lower Darling River and the Great Anabranch. This contributed to over 15.1 million megalitres that passed across the border into South Australia during 2010-2011.

With the Menindee Lakes again currently being managed under flood operations and with high flows in the Murray River, together with some of the biggest flood flows in decades in the Murrumbidgee River, it is likely that a significantly higher volume will pass into South Australia this year.

Reviewing operations and the Memorandum of Understanding

In 2010, the Commonwealth and NSW Governments entered into a *'Memorandum of Understanding (MoU) for the cooperative investigation and subsequent implementation of key water reform initiatives in New South Wales, including Broken Hill's urban water supply and Menindee Lakes operational arrangements.'*

The MoU followed investigations undertaken in a joint NSW-Commonwealth project 'Darling River Water Savings Studies', which identified a number of potential options for infrastructure and changed operations at the lakes.

The investigation proposed by the Commonwealth Government under the MoU focussed on one of the potential options only. This option involved effectively decommissioning two of the lakes - Menindee and Cawndilla - as water storages.

Within the MoU, the NSW Government identified three specific requirements that needed to be met in the investigations.

After 18 months of work, it became clear that the Commonwealth's preferred option did not meet the NSW requirements stipulated in the MoU and the NSW Government subsequently withdrew from the Memorandum of Understanding.

The first requirement was that there be no reduction in the reliability of water availability to downstream users. This includes users in NSW, Victoria and South Australia. The investigations showed there would be significant impacts on water availability to downstream users in sequences of dry years.

This is hardly rocket science. If you start a dry sequence with only two out of the four lakes in the Menindee scheme full, of course you will run out of water quicker.

The hydrologic modelling, that was independently reviewed by Bewsher and Associates, showed that under the Commonwealth's proposal the lakes were effectively dry, at less than 100 gigalitres capacity for 18 per cent of the time, as opposed to 2 per cent of the time under current arrangements. This gets worse if you overlay extended dry sequences under a future climate change scenario.

The second NSW requirement was that the environmental values of the lakes could not be compromised. However, the Commonwealth's proposal involved the surcharge and extended inundation of the two upstream lakes in the system, including the floodplain of the Darling River that connects the four smaller lakes.

Lake Cawndilla bird life. Photo courtesy Barry Philp State Water Corporation

This floodplain provides the habitat for the enormous biodiversity found at the Menindee Lakes and extended inundation would destroy this habitat.

There have been more bird species identified at the Menindee Lakes than at Kakadu National Park, and NSW is not prepared to threaten these unique environmental values, which provide a huge tourist drawcard and a major contribution to the economy of the area.

Thirdly, NSW required in the MoU that the Commonwealth identify an alternative secure water supply for Broken Hill.

The indicative capital costs of the Commonwealth proposed Managed Aquifer Recharge scheme to provide an alternative water source for Broken Hill were found to be prohibitively expensive. Further, this did not include the significant costs of water treatment and the on-going costs of operations and maintenance that would have to be borne by residents of Broken Hill and Menindee.

The way forward

In the letter to the Prime Minister advising the reasons for withdrawing from the MoU on Menindee, the NSW Premier indicated that NSW remained committed to investigating options for the improved management of the Menindee Lakes. However, whatever option is agreed must meet the NSW requirements under the MoU.

The Darling River Water Savings Studies have previously identified other potential infrastructure works and changes to existing operating rules that would generate more modest, but still significant, water savings while protecting the values of the Menindee Lakes.

The NSW Government will continue to work with the Commonwealth to progress these options, but is not prepared to compromise the enormous water supply benefits provided to all states and the natural values of the Menindee Lakes, to meet unspecified environmental objectives downstream.

It is important that the management of the Menindee Lakes now, and into the future, addresses environmental, social, economic and cultural issues, both at the regional and Basin-wide level.

Paddle streamers in the Darling River, downstream of Menindee. Photo courtesy Rachael Strachan

More detailed information about the management of the Menindee Lakes including the management of the flood flows in the Barwon Darling and the Menindee Lakes system, can be found at the NSW Office of Water's website at: www.water.nsw.gov.au

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