**Submission No 98**

# INQUIRY INTO RATIONALE FOR, AND IMPACTS OF, NEW DAMS AND OTHER WATER INFRASTRUCTURE IN NSW

**Organisation:** Lachlan Valley Water Inc

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# Submission to
# Portfolio Committee No. 7 – Planning and Environment

# Inquiry into the rationale for, and impacts of, new dams and other water infrastructure in NSW

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## EXECUTIVE SUMMARY

Lachlan Valley Water welcomes the opportunity to provide a submission to this Inquiry, and summarises our views as follows:

(a) Lachlan Valley Water believes that the findings of the NSW State Infrastructure Strategy, plus the additional investigations that have been undertaken since 2014, and the allocation history of the Lachlan, indicate that the Lachlan has low drought security and low flood management capability. This information supports the need for an infrastructure project which offers a significant improvement in water security and reliability.

(b) Lachlan Valley Water considers that increasing the storage capacity of Wyangala Dam will improve the capacity to manage downstream flood extent and duration, and therefore reduce the economic impacts of flooding.

(c) It is important that the detailed hydrological modelling is made available to stakeholders to allow better understanding of what the 21,050 ML/year average improved reliability translates to over different climate periods. For stakeholders to have confidence in the information it is essential that transparency of the models used is available.

(d) Lachlan Valley Water agrees that the business case is an essential component of the project and must address both the value of improved water reliability and the benefits from improved flood mitigation capability.

(e) Lachlan Valley Water fully supports that the Wyangala Dam project should not result in the issue of new water licences, but instead an increase in the reliability of existing licences.

(f) The business case for the new dams must be publicly available and clearly explain how capital and operational costs will be attributed across the full range of beneficiaries.

(g) Lachlan Valley Water supports the requirement for the Environmental Impact Statement to fully assess the environmental impacts of the project.

(h) A positive economic and social impact of the project is expected to be an increased capacity for usage in the Lachlan Regulated River to reach the WSP Plan Limit and the Basin Plan SDL.

(i) Lachlan Valley Water fully supports consideration of complementary measures to improve environmental outcomes, including but not limited to improving fish passage, installing pumps to improve delivery of water to environmental sites, and curtains on dam storage offtakes to help reduce thermal pollution.

**SUBMISSION TO INQUIRY INTO THE RATIONALE FOR, AND IMPACTS OF, NEW DAMS AND OTHER WATER INFRASTRUCTURE IN NSW**

## 1. Introduction

Lachlan Valley Water (LVW) welcomes the opportunity to make a submission to this inquiry. Lachlan Valley Water is an industry organisation representing more than 500 surface water and groundwater entitlement holders in the Lachlan and Belubula valleys. Irrigated agriculture is an important component of the regional economy, and LVW supports sustainable, productive and efficient water use.

Membership of LVW is voluntary and our members represent all categories of licences except for those held by environmental water managers. This submission is made on behalf of all members, but individual members also reserve the right to make their own submissions.

## 2. Terms of Reference

The Portfolio Committee No.7 – Planning and Environment is inquiring into the rationale for, and impacts of, new dam and mass water storage projects proposed by WaterNSW including Wyangala, Mole River and Dungowan Dam projects, the Macquarie re-regulating storage project and the Western Weirs project, particularly:

a) The need for the projects, including the historical allocation of water and consideration of other options for ensuring water security in inland regions.
b) The economic rationale and business case of each of the projects, including funding, projected revenue, and the allocation and pricing of water from the projects
c) The environmental cultural, social and economic impacts of the projects, including their impact on any national or state water agreements, or international environmental obligations
d) The impacts of climate change on inland waterways, including future projections, and the role of dams and other mass water storage projects in ensuring security of water supply for social, economic and environmental outcomes
e) Water infrastructure technologies that may promote enhanced environmental outcomes
f) Any other related matter

Our submission focuses primarily on the Wyangala Dam project in the Lachlan catchment.

## 3. The need for the projects, including historical allocation of water and other options for water security

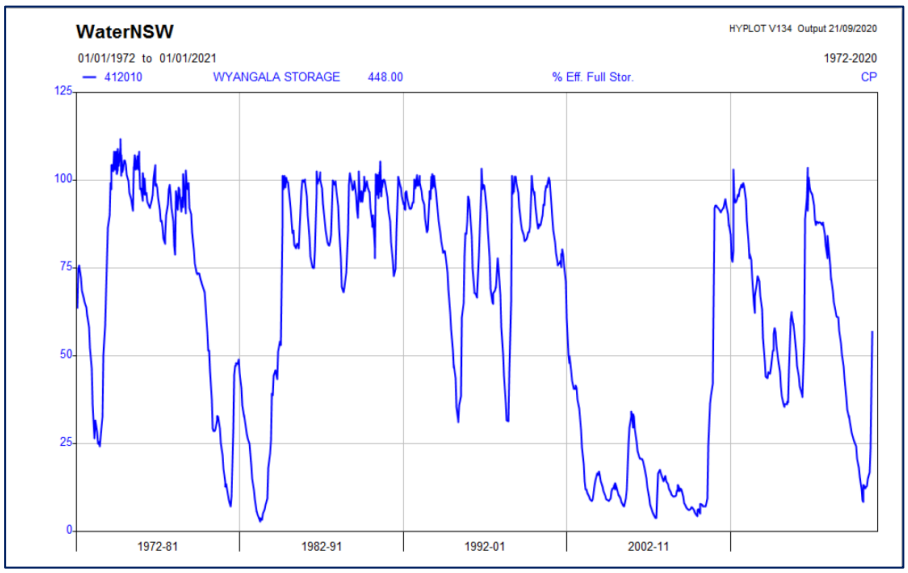
### Water Security and Reliability

There have been several investigations already undertaken to assess the need for projects that improve water security and reliability for the Lachlan.

The State Infrastructure Strategy 2014 identified that over the next 20 years the most important environmental change is likely to be a significant reduction in the availability of water for productive use, and that water must be managed both for immediate needs and for long-term economic and environmental sustainability. The Lachlan, Gwydir and Macquarie

were identified as the highest priority inland catchments, being rated low for drought security due to the low/variable rainfall, high evaporation and limited storages[1]. The Lachlan was also rated low for flood management, and only moderate for flow utilisation and delivery efficiency. The high variability in the Lachlan is illustrated by the storage level graph below:

**Figure 1: Wyangala Dam Storage level 1971 - 2020**




Source: WaterNSW realtime data website

The State Infrastructure Strategy 2014 was followed by several investigations into options to improve water security and reliability. WaterNSW commenced Phase 1 of the Lachlan Valley Water Security Investigation in 2014, looking at options to improve water security including construction of a new dam on the Belubula River, or the upgrade of existing dams.

Phase 2 of the Water Security Investigation Project was undertaken over 2016 and 2017, and considered a wide range of options included several possible new dam sites, upgrading existing dams, upgrading weirs to improve river operation, piping supplies to provide stock and domestic needs, and changes to the water sharing plans and Basin Plan to enable operational efficiencies. It identified raising the wall of Wyangala Dam as one of the top 4 options, along with a pipeline between Lake Rowlands and Carcoar Dam. The Phase 2 Water Security Project studies included using a Community Reference Group for community feedback, carrying out a willingness to pay study, and some preliminary cost estimates.

In 2018 WaterNSW published the 20 year Infrastructure Options Study Rural Valleys, which stated that the Lachlan Valley is believed to have some of the poorest levels of water security and reliability in the state in terms of regulated/licensed irrigation and urban water supply[2], and listed various water supply infrastructure opportunities and options to improve delivery efficiency. It also identified raising the Wyangala dam wall by 10m as a preferred option, and estimated the cost at $650 million.

The high variability of inflows is reflected in the allocations to licences, and is demonstrated by the last 20 years' history. Persistent low inflows during 2002 – 2010 resulted in all Lachlan licence holders suffering severe restrictions, including local water utilities, stock and domestic and high security as well as general security. Although the Lachlan Water Sharing Plan (WSP) commenced in 2004, it was immediately suspended due to severe water

[1] State Infrastructure Strategy Update 2014, page 82, 86
[2] 20 year Infrastructure Options Study Rural Valleys, WaterNSW, page 38

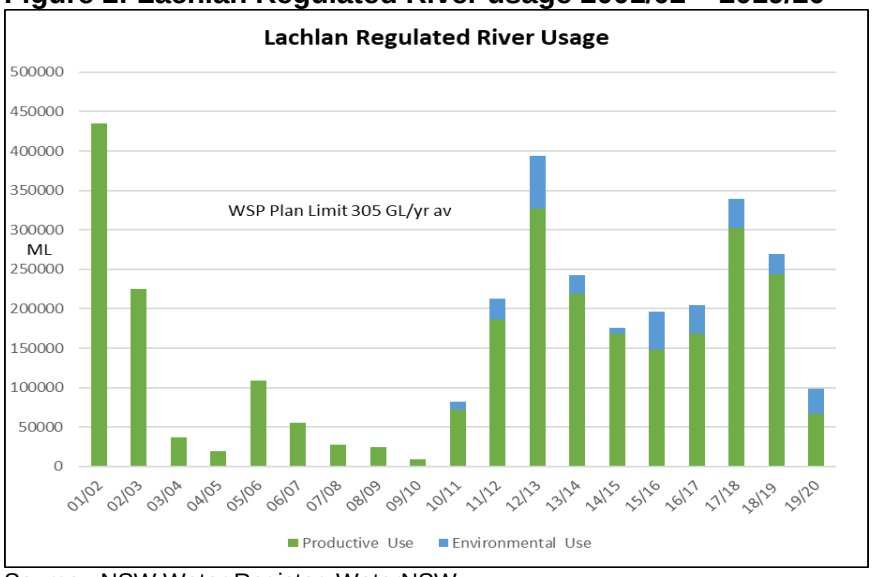
shortage, and was not reactivated until July 2011. The allocation history over the last 20 years is shown in the following table.

**Table 1: Lachlan Regulated River Allocation History 2001/02 – 2020/21**

| Year | Local water utility | Stock & domestic | High Security | **General Security –** maximum AWD (allocation) issued in that year |
|---|---|---|---|---|
| 2001/02 | 100 | 100 | 100 | 58 |
| 2002/03 | 100 | 100 | 100 | 3 |
| 2003/04 | 70 | 70 | 70 | 0 |
| 2004/05 | 50 | 30 | 30 | 0 |
| 2005/06 | 100 | 100 | 100 | 19 |
| 2006/07 | 80 | 80 | 80 | 0 |
| 2007/08 | 70 | 50 | 30 | 0 |
| 2008/09 | 70 | 50 | 30 | 0 |
| 2009/10 | 50 | 15 | 10 | 0 |
| 2010/11 | 100 | 100 | 100 | 117 |
| 2011/12 | 100 | 100 | 100 | 136 |
| 2012/13 | 100 | 100 | 100 | 0 |
| 2013/14 | 100 | 100 | 100 | 0 |
| 2014/15 | 100 | 100 | 100 | 0 |
| 2015/16 | 100 | 100 | 100 | 25 |
| 2016/17 | 100 | 100 | 100 | 131 |
| 2017/18 | 100 | 100 | 100 | 2 |
| 2018/19 | 100 | 100 | 100 | 0 |
| 2019/20 | 100 | 100 | 83 | 0 |
| 2020/21 ytd | 100 | 100 | 100 | 28 |

Translating the allocation history into actual usage is shown below:

**Figure 2: Lachlan Regulated River usage 2001/02 – 2019/20**




Source: NSW Water Register, WaterNSW

The usage history reflects the allocation history, with the licenced usage over the Millenium drought from 2002/03 to 2009/10 averaging only 63,200 ML/year, and falling as low as 8,998 ML in 2009/10[3]. This lack of security had a significant financial impact on the region, and the Lachlan's long-term average annual usage is now modelled as being around 23,000 ML/year below the Plan Limit. Water security for towns is now moving towards being significantly, although not fully, supported by groundwater.

[3] NSW Water Register

An additional factor is that over the last 20 years there has been large year-to-year variability in inflows, as reflected in Figure 1, which in turn affects water security, reliability and the flood impacts. It is likely that climate change could increase this level of variability, and our submission expands on this in section 4.

It is important that stakeholders see the detailed hydrological modelling to better understand what the 21,050 ML/year average translates to over a longer period, and for stakeholders to have confidence in the information it is essential that transparency on the models used is available. LVW's conclusion is that the improved reliability does not translate to 21,050 ML every year, but much less, or even no increase in wet years, and significantly more than 21,050 ML year in dry sequences, when reliability is more important.

***LVW considers that the findings of the NSW State Infrastructure Strategy, plus the additional investigations that have been undertaken since 2014, and the allocation history of the Lachlan confirm the low drought security, and support the need for a project which offers a significant improvement in water security and reliability.***

**Flood Management**

Raising the dam wall will also increase capacity to manage flood impacts. Wyangala has only 4% airspace, so LVW's understanding is that the main benefit will be in large flood events. 2016/17 is a good example of these impacts – in 2016/17 there were 1,495,000 ML inflows to Wyangala, the majority received between July and October 2016, and 900,000 ML of these inflows were released between August and November 2016. In addition, there were large downstream tributary inflows, including from Bland Creek into Lake Cowal, with the overall outcome being that the valley suffered widespread flooding. The Newell Highway was closed for 42 days between West Wyalong and Forbes, and many other roads also closed for days or weeks, depending on their location.

WaterNSW assessed that 1,800,000 ML flowed past Willandra Weir into the lower Lachlan in 2016/17, and that tributary inflows downstream of the dam were more than 1,000,000 ML.

It is important that the hydrological modelling for the Wyangala project includes an assessment of what impact the capacity to retain an additional 650,000 ML of inflows would have had on the extent and duration of flooding in 2016, and on other large flood events. This is necessary because retaining 650,000 ML in Wyangala does not translate to 650,000 ML less flow downstream because timing of flows would allow some of the downstream tributary inflows to flow into the river. Hydrological modelling is needed to provide an accurate forecast of this.

**Figure 3: Flood Impacts 2016**

Jemalong, 30km west of Forbes, looking south east, September 2016.

***LVW considers that increasing the storage capacity of Wyangala Dam will improve the capacity to manage downstream flood extent and duration, and therefore reduce the economic impacts of flooding.***

***It is important that the detailed hydrological modelling is made available to stakeholders to allow better understanding of what the 21,050 ML/year average improved reliability translates to over different climate periods, and for stakeholders to have confidence in the information it is essential that full transparency of the models used is available.***

## 4. The economic rationale and business case of each of the projects, including funding, projected revenue, and the allocation and pricing of water from the projects

### Business Case

In October 2019 it was announced that Commonwealth and NSW Government were to provide $650 million funding on joint basis. Half of Commonwealth funding was to be from the National Water Infrastructure Development Fund and half from National Water Infrastructure Loan Facility, which would ultimately need to be repaid by NSW Government. In September 2020 an announcement was made by the Commonwealth Government that it was committing a further $283 million to the Wyangala Dam and Dungowan Dam projects.

The business case is an essential component of the project and must address both the value of improved water reliability as well as the benefits from improved flood mitigation capability.

Water security has a significant community-wide benefit for towns, environment, licence holders and farmers, and this must be properly assessed and factored into costs

The business case should also take into account that the Lachlan Valley Water Security Project investigations state that a dam safety upgrade was already required at Wyangala Dam in order to provide acceptable Flood Capacity in accordance with the NSW Dam Safety Regulators guidelines. The cost of this upgrade was estimated at between $200 million – $250 million. Consequently the additional cost of the increased dam capacity is in the order of $400-$450 million, and in our view, to combine two projects makes economic sense.

LVW agrees that the detailed business case, when completed, must be available to all interested parties in order to understand how costs will be attributed to the full range of beneficiaries, including the Government on behalf of the wider community, and what this translates to in $/ML for existing licences. It is our understanding that the capital investment in the dam upgrade is a Government commitment to drought security that will not require repayment, and that the water pricing will factor in the operational costs.

***Lachlan Valley Water agrees that the business case is an essential component of the project and must address both the value of improved water reliability and the benefits from improved flood mitigation capability.***

### Economic Rationale

Lachlan Valley Water believes there is a strong economic rationale to improve water security and reliability in this valley. It is also our clear understanding that the project will not result in the issue of new licences, but improved reliability for existing licences.

We assess that the estimated 21,050 ML/year increase in reliability for general security does not translate into 21,050 ML every year, and consequently it is essential that the hydrological modelling provides an accurate forecast of the timing and extent of the improved reliability in order to allow an accurate calculation of the cost benefit analysis.

For example, the high year-to-year variability the Lachlan has had over the last 20 years may mean that improved reliability translates to 60,000 ML in a year like 2019/20, but no change in 2016/17 and 2017/18.

To clarify, in 2016/17 the inflows to Wyangala Dam were 1,495,000 ML, but in 2017/18 the inflows were only 165,000 ML, and in 2018/19 fell even further to only 88,000 ML. The Lachlan has high operational requirements and the water sharing plan specifies a visible flow target near the end of the system, so it requires around 180,000 ML/year to run the river, plus a further 53,000 ML to deliver water for local water utilities, stock and domestic licences and high security licences, ie, 233,000 ML/year to meet essential requirements.

The result of the extreme year-to-year variation that occurred from 2016/17 to 2017/18 and then 2018/19 meant that by 1 July 2019 there was insufficient water available in storage to provide 2 years' operational requirements and deliver high security needs and general security water. In 2019/20 high security licences received only 83% allocation, and the delivery of 67,000 ML of water remaining in general security accounts was suspended. This occurred less than 3 years after a large flood event, so our conclusion is that increased storage capacity will provide a significant reliability improvement.

Based on ABS Gross Value of Agricultural Production 2015/16 (ABS 4610 055 008) for the Lachlan NRM region, the farm gate value of irrigated agriculture was $222 million, or $653/ML used, so the direct value of improved reliability on average is $13.75 million/year, and the wider community value approximately $30 million/year.

Security for town water supplies and stock and domestic is important, and also for high value enterprises, whether these involve agriculture, processing, mining, or other businesses, all of which have a major impact on the regional economy. Agriculture is a diverse industry in the Lachlan, there are intensive agricultural businesses relying on secure water supply including vegetable growers, fruit and nut growers, and dairy farms, which includes Moxey Farms, Australia's largest dairy farm, milking 8,000 cows, producing around 115 million litres of milk per year and employing over 250 people.

Improved reliability also benefits agricultural enterprises based on general security access and supports their capability to maximise the productive use of water.

**Allocation and Pricing of Water from the Project**

It is LVW's clear understanding that the Wyangala Dam project will not result in any new licenced entitlement being issued, but an increase in the reliability of existing licences. LVW strongly supports this approach.

We understand that pricing will be determined by IPART once the funding arrangements between the NSW Government and Commonwealth Government are finalised and the operating costs are determined. It is essential that, as with current pricing determinations, licence holders have input into the pricing process. As noted earlier, based on the information available it is our understanding that the capital component of the dam upgrade is a Government commitment to drought security and will therefore not require repayment.

***Lachlan Valley Water fully supports that the Wyangala Dam project should not result in the issue of new water licences, but an increase in the reliability of existing licences.***

***The business case must be publicly available and clearly explain how costs will be attributed across the full range of beneficiaries.***

**5. The environmental, cultural, social and economic impacts of the projects, including their impact on any national or state water agreements, or international environmental obligations.**

**Environmental Impacts**

LVW understands that a comprehensive investigation of the environmental impacts of the project is required, and that an Environmental Impact Statement (EIS) will be prepared and is anticipated to be on exhibition for public submissions by June 2021. We also understand that dam construction work cannot commence until required approvals are granted. The matters to be addressed in the EIS are extensive and detailed, as described in the Secretary's Environmental Assessment Requirements, which is available on the NSW planning portal and includes:

- Detailed water balance for groundwater and surface water
- Impacts to river hydrology, hydraulics and geomorphology
- Extent and changes in longtitudinal and lateral hydrologic connectivity
- Anticipated impacts to flood flow transmission and continuity
- Changes to groundwater recharge and levels
- An assessment of the project's consistency with laws and rules that govern the use or impacts of water, or affect water users.
- Assessment of terrestrial, riparian and floodplain biodiversity and ecology that addresses all direct, indirect and prescribed impacts of the project on flora and fauna, threatened species, populations and communities for the construction and operation of the asst, including flows dependent and groundwater dependent ecosystems
- Assessment of impacts to listed threatened species and ecological communities, migratory species and wetlands of international importance.
- A description and assessment of how the dam and associated water infrastructure will be managed over the full range of operating conditions, and how this relates to aquatic biodiversity mitigation and offsetting strategies.

LVW understands that one of the concerns about possible environmental impacts is how the project will affect floodplain flows near the end of the system, where many environmental assets are located. One of the issues appears to be how major flood events that inundate the lower Lachlan floodplains would be affected by the capacity to retain an additional 650,000 ML in Wyangala.

As noted in section (3) earlier in this submission, in 2016/17 there was a major flood event and substantial inflows to the Lachlan system both above and downstream of the dam, and WaterNSW reported that 1,800,000 ML flowed past Willandra Weir in that year. Both the EIS and the hydrological modelling should include an assessment of the effect that retaining an extra 650,000 ML in Wyangala under such conditions would have had on flows reaching the lower Lachlan, taking into account that lower volumes released from the dam should enable additional downstream tributary inflows to flow into the river.

This assessment should also take into account that other factors which already contribute to changed flow volumes in the lower Lachlan include structures such as the Willandra Weir. This has altered the commence-to-flow levels for Willandra Creek, and therefore the distribution of flows between the creek and the main stem of the river.

There are no Ramsar sites in the Lachlan valley, however, protection of habitats for migratory bird species under the JAMBA and CAMBA agreements is an issue that will need to be considered as part of the EIS.

***Lachlan Valley Water supports the requirement for the EIS to fully assess the environmental impacts of the project.***

**National or State Water Agreements**

The Lachlan Regulated Water Sharing Plan (WSP) established the water shares at 75% of average annual flow for the environment and 25% for productive use. The Commonwealth and NSW Governments now own 127,246 ML of water entitlement in the Lachlan Valley[4], resulting in a further reduction in the share of river flow available for productive water use to only 20%. The WSP provides for translucent flows of up to 350,000 ML/year, plus a water quality allowance of 20,000 ML and an environmental water allowance of 20,000 ML.

The NSW Water Sharing Plans and the Murray Darling Basin Plan are clear that usage cannot increase above the Plan Limit and the Sustainable Diversion Limit (SDL). However, currently the Lachlan's long-term average annual usage is modelled as being around 23,000 ML below the Plan Limit, and the MDBA's data[5] shows that total actual take in the Lachlan for the 6 years from 2012-13 to 2017-18 is 410 GL, or 10.8%, below the total permitted take over the same period.

The improved reliability provided by the Wyangala Dam augmentation would therefore assist productive usage to reach the allowed limit, and would support economic gains for both agriculture and the whole community. However, while the long-term average annual usage cannot exceed the WSP Plan Limit, an amendment to the WSP will be required to address any changes to timing or distribution of water reserved for environmental purposes.

**Social and Economic Impacts**

As outlined in section (4) of this submission, LVW considers that there will be positive social and economic impacts for both agriculture and the wider community in the Lachlan Valley as a result of improved water reliability, and therefore average annual usage being able to reach the WSP Plan Limit and the Basin Plan SDL.

The improved capacity to manage flood mitigation also provides social and economic benefits. LVW anticipates that the business case will provide detailed assessment of these economic impacts.

***A positive economic and social impact of the project is expected to be an increased capacity for Lachlan Regulated River usage to reach the WSP Plan Limit and the Basin Plan SDL.***

[4] https://www.industry.nsw.gov.au/water/environmental-water-hub/public-register/dashboard/held
[5] Murray-Darling Basin Authority Transition Period Water Take Report 2017-18, p 181

## 6. The impacts of climate change on inland waterways, including future projections, and the role of dams and other mass water storages in ensuring security of water supply for social, economic and environmental outcomes.

As outlined under section (3) LVW believes that climate change may result in greater climate variability in the future, with potentially longer dry sequences. Consequently under those conditions we believe that a project which underpins greater water security and reliability is essential to sustaining rural communities and businesses.

Additionally, if climate change results not only in more severe dry periods, but also more intense rainfall events, then increased storage is a key strategy, otherwise the risk is that towns and communities become less viable, but potentially also that flood problems are accentuated.

We understand also that the Regional Water Strategies (RWS) being developed by DPIE-Water are planned to incorporate climate change projections in managing water needs for regions over the next 20-40 years. The Lachlan RWS was released in late September 2020 and is expected to be finalised in 2021. LVW intends to provide community input on the draft RWS.

## 7. Water infrastructure technologies that may promote enhanced environmental outcomes

LVW concurs that a full range of complementary measures should be considered for investment to provide improved environmental outcomes, over and above what can be achieved simply by the management of held environmental water.

The Lachlan Water Sharing Plan limits long-term average annual licensed usage to only 25% of the long-term average annual flow[6], and environmental water holdings now account for 19% of the total licenced entitlement on the Lachlan, ie, 80% of long-term average annual flow is now reserved for the environment. However, we recognise that outcomes are not simply the result of volumes of flow and that infrastructure can help address difficulties with the effective delivery of environmental water. Infrastructure options include:

- improvement to fish passage through fish ladders on weirs, or changes to culverts and other road infrastructure that may be impeding fish passage
- installation of pumps or other infrastructure to improve the delivery of water to environmental sites
- curtains on dam storage offtakes that will help reduce thermal pollution
- fish screens on pump intakes

Such measures could be funded by implementing strategic temporary trading of environmental water allocations, in those years when the environmental allocation holdings exceed the requirements.

***Lachlan Valley Water fully supports investigation of measures such as improving fish passage, installing pumps to improve delivery of water to environmental sites, and curtains on dam storage offtakes to help reduce thermal pollution.***

[6] Clause 39, Water Sharing Plan for Lachlan Regulated River Water Source 2016, Note 3