

# Improved Flow Management Works at the Murrumbidgee River – Yanco Creek Offtake

March 2017

The Basin Plan sets a sustainable diversion limit (SDL) for each catchment and aquifer in the Basin, as well as an overall limit for the Basin as a whole. In order to meet the new limits, 2,750 GL of water needs to be recovered Basin-wide. NSW's share of this "SDL gap" is 1,310 GL, with approximately 965 GL<sup>1</sup> of water recovered to date. For the remaining 345 GL of recovery, NSW is pursuing investment by the Commonwealth Government in a range of projects and programs, with infrastructure projects being prioritised over water buybacks.

This document provides an overview of the *Improved flow management works at the Murrumbidgee Rivers – Yanco Creek offtake* supply measure project being proposed by NSW.

This business case proposes infrastructure upgrades to the Yanco Creek regulator and two new fishways. This will enable more efficient delivery of water to the Mid-Murrumbidgee wetlands as well as reducing barriers to fish passage. The resulting outcome will be the delivery of equivalent environmental outcomes as proposed in the Murray-Darling Basin Plan (Basin Plan) but with less water, so generating a possible Sustainable Diversion Limit (SDL) offset.

## Fast Facts

<b>Location</b>	Yanco Creek system, 20 km west of Narrandera
<b>Type of project</b>	Supply measure involving a new regulator including fishways which allow more flexibility and control in environmental water delivery.
<b>Status</b>	Business case submitted in August 2015 and is being assessed by the inter-jurisdictional SDL adjustment advisory committee (SDLAAC).
<b>Estimated SDL adjustment</b>	Potentially 10 - 15 GL/year
<b>Related SDL adjustment projects</b>	This proposal is one of the three related SDL-offset initiatives being progressed for the Murrumbidgee River System. The others being the modernisation of effluent creeks, and CARM. Any potential inter-dependencies between this supply measure and other measures cannot be formally ascertained at this time, until a final package of proposed supply measures is identified and modelled by the MDBA.

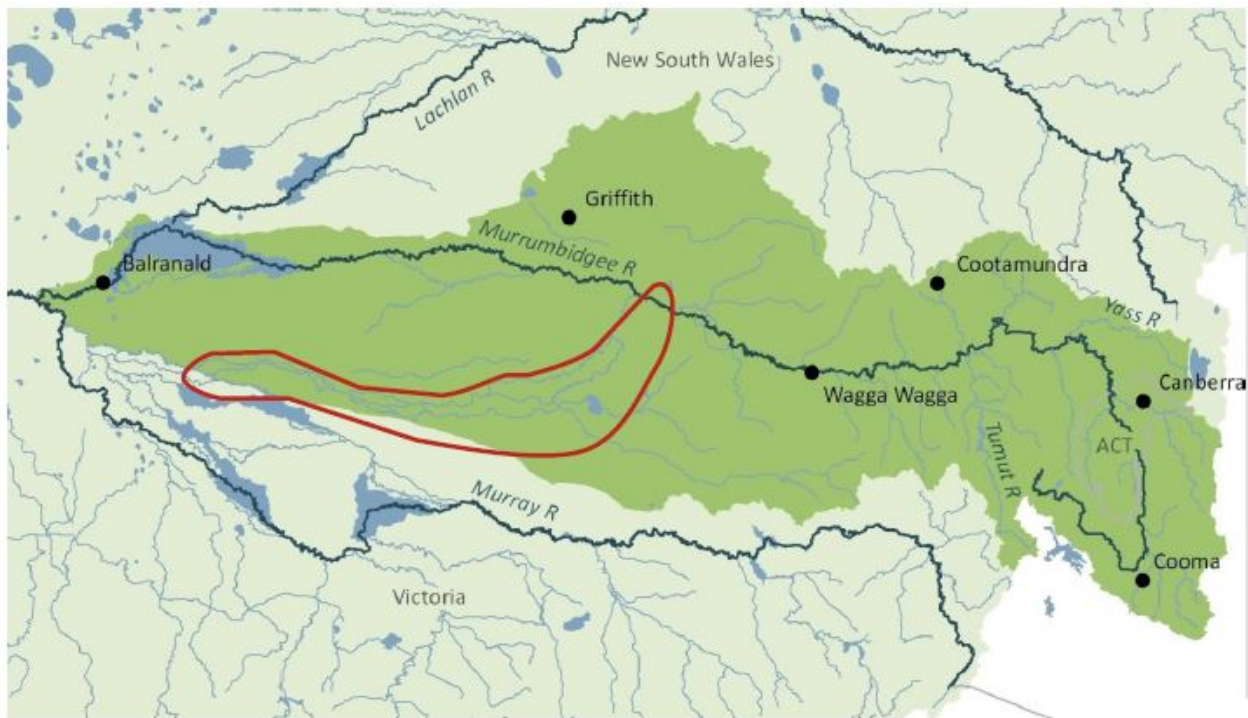
## The project area

The Yanco Creek system is a channel and floodplain system that commences from the Murrumbidgee River at Yanco Weir located about 20 km west of Narrandera. The 'Yanco Creek system' consists of a series of creeks including Yanco, Colombo, Billabong and Forest Creeks on the southern side of the Murrumbidgee (Figure 1).

<sup>1</sup> Information sourced from MDBA website. Includes Commonwealth water recoveries contracted through the Sustainable Rural Water Use and Infrastructure Program (SRWUIP) Infrastructure projects, the South Australian River Murray Sustainability Program (SARMSP) and the Water Smart Australia Program. Estimates do not take into account potential changes as a result of the Northern Basin Review, and proposed changes to the long term diversion limit equivalent factors.

The site of the Yanco Creek off take is located at the confluence of the Murrumbidgee River and Yanco Creek (Figure 2).

Figure 1: Murrumbidgee catchment with the Yanco Creek system circled in red



## The proposal

The business case proposes a new regulator in Yanco Creek. This project enables an increased proportion of river flows to reach the mid-Murrumbidgee wetlands, which is impacted by the Yanco Creek cutting that currently diverts over 10 percent of Murrumbidgee flows in its unregulated condition. It is designed to target the supply of flows of up to 45,000 ML/d for the mid-Murrumbidgee Floodplain Wetlands. The proposed works include:

- Yanco Creek Regulator and Fishway – a new regulator to be installed in Yanco Creek to allow regulation of flows between the Murrumbidgee River and Yanco Creek. Operation of the regulator during targeted environmental watering events for the Mid Murrumbidgee improves watering efficiency of the environmental asset.
- Increased weir pool level at Yanco weir - The weir pool will be raised at the Yanco Weir so that environmental flows can be provided to Yanco Creek without having to provide large flows downstream in the Murrumbidgee River.
- New Murrumbidgee Regulator at Yanco Weir - An investigation of the structural and mechanical capacity of the existing gated regulator at Yanco weir indicates that it is not suitable for upgrading for the increased water level associated with the new weir pool design level. It is proposed to install a new regulator in the meander reach that currently has the older Yanco fixed crest weir.
- Fishway at new Murrumbidgee Regulator - The project will provide for both upstream and downstream fish passage in the Murrumbidgee River at Yanco weir. The existing structures are significant barriers to fish migration in both directions, except during high flow events.

## Ecological Outcomes

The mid-Murrumbidgee wetlands comprise relatively intact flood-dependent vegetation communities that provide crucial habitat for numerous significant fauna species, and are

targeted for inundation through several of the Specific Flow Indicators (SFIs) set by the Basin Plan. The wetlands are an important area for waterbirds including breeding of colonial nesting waterbirds and contain a range of riparian and wetland vegetation communities that are critical to several fish species in the Murrumbidgee, including Murray Cod.

Anticipated environmental benefits associated with the project stem from the ability to achieve targeted watering events (i.e. SFIs) more frequently and with less water. The project provides a significant improvement in the achievement of all SFI events for the mid-Murrumbidgee Wetlands, along with improvements to the Lower Murrumbidgee Floodplain Wetlands and Murrumbidgee River indicators. For the mid-Murrumbidgee wetlands the project not only increases the frequency of watering, but also provides an increased and improved extent of inundation when watering does occur.

Additionally, the Murrumbidgee River and Yanco Creek support a valuable native fish community. The current Yanco weir is a barrier to fish through a non-functional submerged fishway that limits fish passage through the structure for flows less than ~25,000 ML/day. The proposed new infrastructure will improve fish passage around the structure.

## Risks and Impacts

A rigorous risk assessment was completed as part of the Business Case development. The table below shows a summary of the risks which had an initial rating of high. Once the mitigation was applied the residual risk was low or moderate. Please refer to the business case for the full risk assessment.

Description of threat	Mitigation
Construction of the new Yanco Creek Regulator will reduce waterway connectivity between Yanco Creek and the Murrumbidgee River impacting of large bodies fish movement.	Large bodied fish need to migrate to complete their lifecycle; movement currently impacted for flows < 2500ML/day. Construction of a fishway will provide fish passage for larger bodied fish (including juvenile fish) when the regulator is closed. Regulator will however, not be closed at all times, and during periods when it is open there will be no barrier to large bodied fish movement.
Flow regulation down the Yanco (reduction inflows) would result in the reduction in the suitability of the waterways as habitat for State and Federally listed species; including Trout Cod, Murray Cod, Murray Crayfish, Silver Perch, Pygmy perch, Purple-spotted gudgeon and the listed Murray-Darling Basin population of Eel-tailed / Freshwater Catfish.	The operation rules are proposed to ensure there is no detrimental impact to flow requirements to support native fish populations.
Raising the weir on the Murrumbidgee river will result in further detrimental impacts on medium bodied fish passage	The current structure is not conducive to fish passage. It has a non-functional submerged passage and flows of < 2500ML/day, results in no fish passage with the current weir structure and its hydrology. A more suitable fish passage option has been designed as part of this business case to mitigate the existing issues and mitigate any impacts of raising the weir structure for medium bodied fish
Lack of ability to reach a consensus on operational rules.	The process of setting operational rules may result in different opinions by parties representing irrigation requirements, fish passage and broader ecological objectives of the works. Operational and water sharing arrangements will be developed through the relevant committees, such as the WNSW CSC and DPIW SAP
Costs exceed approved funds due to errors or emissions or because of costly mitigation requirements.	50% contingencies factored into cost estimates for the construction works required. Provision for additional Project Management Cost including modelling is factored into estimates.

Unforeseen delays in project delivery due to flooding.

Contingencies for flooding are factored in.

## Consultation

A Stakeholder Management Strategy guided engagement and communication activities for the project. Targeted discussion with interest groups regarding the project identified a number of potential issues for consideration and response in this business case. The majority of issues raised were addressed within the design process and the development of proposed operating rules for the new structures.

Ongoing engagement with interest groups in future project stages is an essential component to the delivery program for the project. Community involvement in the development and formalisation of operational rules for Yanco Creek offtake may assist to alleviate residual concerns regarding provision of flows in Yanco Creek system during times of water scarcity.

## Next steps for adjustment mechanism confirmation

Date	Details
<b>30 June 2017</b>	BOC notification of final approved SDL adjustment package
<b>Late October 2017</b>	MDBA public consultation on proposed SDL adjustment
<b>15 December 2017</b>	MDBA recommend SDL adjustment to Commonwealth Water Minister
<b>February 2018</b>	Amendments tabled in parliament
<b>From March 2018</b>	Commence detailed design, construction and commissioning under Commonwealth funding

## More information

Background on the Basin Plan implementation and the SDL adjustment process can be obtained from:

[www.mdba.gov.au](http://www.mdba.gov.au)

DPI Water is the lead agency for the implementation of the Basin Plan agreements within NSW. Reports on NSW SDL adjustment activities reports can be obtained from:

<http://www.water.nsw.gov.au/Water-management/Water-recovery>

## Acknowledgements

This proposal is being led by WaterNSW in collaboration with DPI Water.

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