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Up effluent creek

Supply measures in the Yanco Creek System

Supply measure projects that purport to save water in the Yanco Creek System will lead to environmental damage and "greater diversions" for irrigation in the Murrumbidgee according to water agencies. They are likely to be unlawful, with no way of properly assessing environmental equivalence as defined in the Basin Plan.

Discussion paper

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Summary

The Murray Darling Basin Plan has been amended to reduce water for the environment by 605 GL via supply measure projects. Supply measures aim to achieve 'equivalent environmental outcomes' with less water. These projects are controversial, with little transparency and often little public support.

Two supply measures are proposed for the Yanco Creek System, an idyllic series of waterways and wetlands that connect the Murrumbidgee to the Murray. Water agencies refer to these waterways, as "effluent creeks". The term appears prescient - should these supply measures proceed the Yanco Creek System will be damaged, with more water going to the Murrumbidgee where it is likely to be extracted for irrigation.

The Yanco Creek System supply measures would cost over $84 million and aim to reduce 'operational surplus' and 'transmission losses'. Both the 'operational surplus' and 'transmission losses' currently provide water to the environment and are naturally occurring parts of the water cycle.

'Operational surplus' refers to flows out of the Yanco Creek System above the minimum prescribed in the Murrumbidgee Water Sharing Plan. That means, the Yanco Creek System creeks are flowing throughout their length and acting as tributaries into the Murray river.

'Transmission losses' refers mainly to water that seeps into banks, waters riparian vegetation, fills wetlands and recharges aquifers. All this water has environmental function and assists the Yanco Creek System to act as a tributary to the Murray River. In other words, water that is currently going to the environment in the Yanco Creek System will be 'saved' through engineering, then given a water licence so it can be available for use in the Murrumbidgee valley.

Water authorities, including the Murray Darling Basin Authority and Commonwealth Environmental Water Office, share this view, with concern that "savings are largely taken up in delivering environmental flows back into the system they were saved from" and that the potential ecological benefit of the project had been "overstated".

Authorities have warned that proposed changes to the Yanco Creek System will reduce water for the environment and lead to "greater diversions" for irrigation. Even if well administered, there are technical difficulties around delivery of environmental water to the area, with NSW policy not guaranteeing the delivery of water to areas like the Yanco Creek System that lack accurate measurement points.

The extraction of Yanco Creek System water could occur through increased use of supplementary flows, environmentally valuable water that cannot be regulated by river

operators. Holders of supplementary flow licences can legally extract supplementary flows, but historically they have not been fully used.

Recently, large on-farm storages have been constructed with government subsidy to capture supplementary flows. The Murrumbidgee Water Resource Plan will dramatically increase the volume of supplementary flows that can be diverted in the Murrumbidgee, above the Lowbidgee area. The Yanco Creek System supply measures would increase the volume of water in the Murrumbidgee, thereby increasing supplementary flows in, more of which would be diverted with new infrastructure and the rebadging of Lowbidgee supplementary licences.

Supply measures aim to achieve 'equivalent environmental outcomes' with less water. To test equivalence, the flow of the original Basin Plan hydrological model at the site is compared with the model revised to include the supply measures. However, the Yanco Creek System had no indicator sites that were defined under the original Basin Plan, making it impossible to prove equivalence. Similar problems with other supply measures have led observers, including SA Royal Commissioner Brett Walker SC, to conclude that these measures are unlawful and vulnerable to legal challenge.

Furthermore, the modelling of these supply measures appears to have been amended to provide an acceptable water saving estimate. This amendment is also likely to be unlawful.

Water users and the local community have complained about the lack of transparency around the Yanco Creek System supply measures. According to a local survey 90% of respondents consider consultation to have been "appalling or disappointing".

If the supply measures proceed, they will be assessed in 2024 and any shortfall in savings made up with water buybacks. This is problematic for several reasons:

- Delays are common in water reform and many years of damage could be inflicted on the Yanco Creek System before this assessment is even begun.
- Measurement and modelling difficulties in the Yanco Creek System give little confidence that any future assessment would be robust.
- Buybacks would require amendments to the Water Act and the Basin Plan, that are highly unlikely to pass Parliament.

The Yanco Creek System a rare example of the condition of the river matching the vision and objectives of the *Water Act* and the Basin Plan. It is the ideal of a healthy, working river. It has outstanding social, economic and environmental values because of the stewardship and commitment of the people that live there and manage it. It is an example of what governments claim to aspire to, but rarely achieve. If the supply measure project goes ahead it will damage the Yanco Creek System, leaving local people and the environment proverbially 'up effluent creek'.

Introduction

In documents recently released to the Senate, water agencies propose a project (specifically a 'supply measure') in the Murrumbidgee and Yanco Creek System called *Modernising supply systems for effluent creeks*.

In our experience, 'effluent creek' is not a hydrological term or accepted part of water management jargon. The Oxford Dictionary defines 'effluent' as most people would understand it - "liquid waste, especially chemicals produced by factories, or sewage."[1]

Could it be that water agencies are simply acknowledging that if this supply measure is implemented, the people and ecosystems of the Yanco Creek System will be left proverbially 'up effluent creek'?

SUPPLY MEASURES

It has long been recognised that the amount of water extracted from the Murray-Darling Basin is unsustainable and, if unchecked, ecosystems would decline irreversibly. Governments have made a series of reforms to address this, notably the Commonwealth *Water Act (2007)* requiring the development of the Murray-Darling Basin Plan.

The Basin Plan became legislation in 2012 and set out new limits on water extraction (Sustainable Diversion Limits or SDLs) for each valley in the Basin. There was a provision in the Basin Plan for state governments to nominate projects by 2017 to achieve 'equivalent environmental outcomes' with less water, with the water saved available to return to irrigation. Thirty-six such projects, known as 'supply measures', have been agreed, and the SDLs were increased by 605GL in May 2018.

Supply measures have been controversial, with little transparency around their form, their ability to deliver water savings, environmental impacts and business cases. Perhaps the most controversial have been the Menindee Lakes Water Savings Project, in the Lower Darling/Baaka, and the Enhanced Environmental Water Delivery Project, which essentially rebadges environmental water already provided in the Basin Plan as water savings.[2,3] These two projects have attracted the most attention because they make up more than one half of all of the proposed water savings. Other supply measures that will have serious detrimental

[1] Oxford Dictionary (2019) https://www.oxfordlearnersdictionaries.com/definition/english/effluent

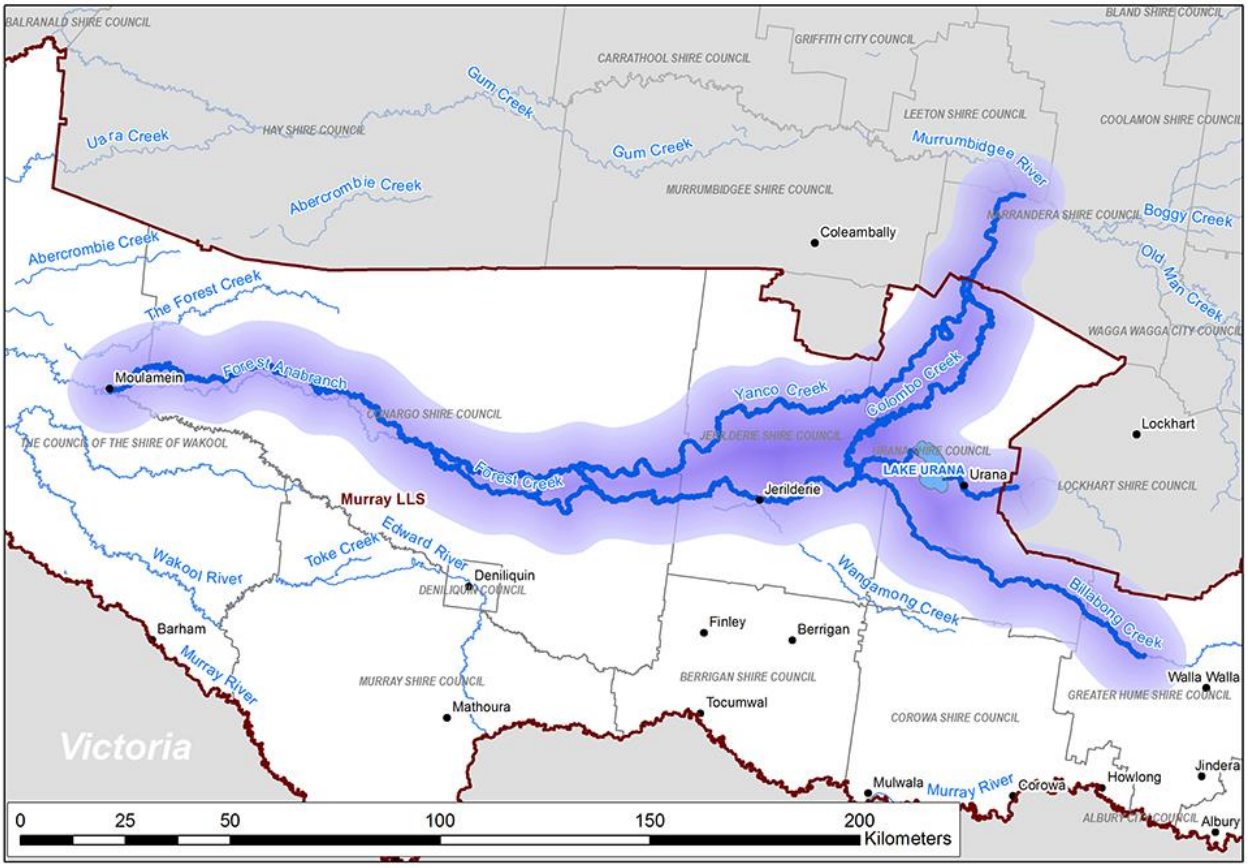
[2] Slattery and Campbell (2018) Desperate Measures: Supply measures, diversion limits and the Murray-Darling Basin Plan, https://www.tai.org.au/sites/default/files/P514%20Desperate%20Measures%20-%20Murray%20Darling%20Basin%20Final_1.pdf

[3] Marshall (2019) *Darling-Baaka wins Council's backing,* https://bdtruth.com.au/main/news/article/11677-DarlingBaaka-wins-councils-backing.html

impacts have received less focus from policy makers, communities and the media, including one in the Yanco Creek System.

The Yanco Creek System flows out of the Murrumbidgee river near Narrandera and eventually into the Murray river near Moulamein. It includes Colombo Creek, Billabong Creek and Forest Creek (Figure 1).

Figure 1: Yanco Creek System



Source: NSW Local Land Services Murray (2019) *Billabong Yanco project,* http://murray.lls.nsw.gov.au/__data/assets/image/0004/597145/Billabong-Yanco-Project-Area-Map.PNG

The system is approximately 800km long and supplies water to the townships of Morundah, Urana, Oaklands, Jerilderie, Conargo, Wanganella and Moulamein, as well as to 250 licenced water users.[4]

> The YCS is a jewel of the Riverine Plains and is the most prominent geographical feature of the area it traverses. The flow of water and riparian environment of the creek system serves as life giving blood to a range of significant wetland areas that are highly valued by the community and must be better managed for the future

[4] Yanco Creek and Tributaries Advisory Council (2004) *The Yanco Creek System Natural Resource Management Plan,* https://landcare.nsw.gov.au/groups/yanco-creek-and-tributaries-advisory-council/reports/natural-management-resource-plan-2006.pdf

> sustainability of the biodiversity of the area. Key wetland areas are Dry Lake, Lake Urana, Wilsons Creek Anabranch, Wanganella Swamp, Kerribirri Swamp, Rhyola depressions and flood runners, break out areas on Back Nullum and Box Swamp on Blue Gate.[5]

Anyone who visits the area would agree with this description. With much of the Basin degraded, the Yanco Creek System stands out, for its healthy creeks, wetlands, agricultural activities and communities. Of particular note is the environmental stewardship of the irrigation community, which developed a Natural Resource Management Plan in 2006. Irrigators pay a voluntary levy to implement the plan, including employing a full-time environmental manager.[6]

In contrast, the Murray Darling Basin Authority (MDBA) describes these waterways as "effluent creeks". One of the two supply measures that will change the management of the Yanco Creek System are referred to as "Modernising supply systems for effluent creeks". [7] The name gives an indication, not only of outsiders' view of the system, but of what is likely to happen to the healthy system under these supply measures.

[5] Yanco Creek and Tributaries Advisory Council (2004) *The Yanco Creek System Natural Resource Management Plan,* https://landcare.nsw.gov.au/groups/yanco-creek-and-tributaries-advisory-council/reports/natural-management-resource-plan-2006.pdf

[6] Yanco Creek and Tributaries Advisory Council (2004) *The Yanco Creek System Natural Resource Management Plan,* https://landcare.nsw.gov.au/groups/yanco-creek-and-tributaries-advisory-council/reports/natural-management-resource-plan-2006.pdf

[7] See for example MDBA (2017) *Modernising supply systems for effluent creeks – Murrumbidgee River,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

Yanco Creek System supply measures

Two supply measures in the Yanco Creek System are, the "Modernising supply systems for effluent creeks" and the "Improved Flow Management Works at the Murrumbidgee River - Yanco Creek Offtake". These projects propose to install a new regulator at where the Yanco Creek leaves the Murrumbidgee. This regulator will:

> 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 assets. Increased weir pool level at Yanco weir – the weir pool will be raised at Yanco weir so that environmental flows can be provided to Yanco Creek without having to provide large flows downstream in the Murrumbidgee River. [8]

The projects together are estimated to cost more than $84 million.[9,10]

Leaving aside the dubious concept that the environment can be made more 'efficient', increasing the 'efficiency' of water delivery to both Murrumbidgee and Yanco Creek environmental assets sounds appealing. However, it ignores that each would be made more 'efficient' at the expense of the other.

Other MDBA documents state that the projects will reduce the 'operational surplus' and 'transmission losses' within the Yanco Creek System.[11] 'Operational surplus' refers to water that flows out of the system above the minimum flow prescribed in the Murrumbidgee

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[8] MDBA (2017) *Improved flow management works at the Murrumbidgee Rivers – Yanco Creek off-take,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

[9] MDBA (2017) *Improved flow management works at the Murrumbidgee Rivers – Yanco Creek off-take,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

[10] MDBA (2017) *Modernising supply systems for effluent creeks – Murrumbidgee River,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

[11] MDBA (2017) *Modernising supply systems for effluent creeks – Murrumbidgee River,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

Water Sharing Plan. That means the 'operational surplus' that allows the Yanco Creek System to flow throughout its length and act as a tributary to the Murray river for Murray water users and environment.

'Transmission losses' refers to seepage and evaporation within the Yanco Creek System. Seepage is water that wets the banks, waters fringing vegetation, fills waterholes and recharges aquifers. Reducing seepage means less water is available to the environment.[12] Transmission losses also include evaporation, necessary for rainfall. In other words, both the 'operational surplus' and 'transmission losses' currently provide water to the environment and downstream users and are vital, naturally occurring parts of the water cycle.

The water that is 'saved' from the Yanco Creek System will remain in the Murrumbidgee. The proposal is to create water entitlements from the savings:

> Water savings will be converted into a callable general security entitlement. A rules based account will also be created to mitigate third party impacts in the NSW Murray arising from captured operational surplus flows.[13]

That is, water that is currently going to the environment in the Yanco Creek System will be 'saved' with a project that will deliver less water to the environment. It will then be turned into a water licence available for use in the Murrumbidgee.

The 'callable general security entitlement' will be created in the Murrumbidgee for delivery into the Murray to compensate for water that would otherwise have flowed to the Murray from the Yanco Creek System. This water will no longer flow down the Yanco Creek System, but down the main channel of the Murrumbidgee. It is likely to encounter difficulties there, particularly given the increase in irrigation activity in the lower Murrumbidgee.[14] In other words, water will be taken out of the Yanco Creek System, potentially denied to some Murray users and diverted into an entitlement with uncertain reliability.

This is not only the opinion of the authors. The MDBA undertook an assessment of the Yanco Creek System supply measure, which said:

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[12] Walker (2019) *Murray-Darling Basin Royal Commission Report,* https://www.mdbrc.sa.gov.au/sites/default/files/murray-darling-basin-royal-commission-report.pdf?v=1548898371

[13] MDBA (2017) *Modernising supply systems for effluent creeks – Murrumbidgee River,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

[14] Slattery and Campbell (2019) *Dam Shame, the new dams politicians won't talk about*, https://www.tai.org.au/content/dam-shame-new-dams-politicians-won-t-talk-about

> There is concern that the water savings are largely taken up in delivering environmental flows back into the system they were saved from.[15]

That is, to maintain the same environmental outcomes, the water 'saved' would need to be replaced with water held by the Commonwealth Environmental Water Holder (CEWH). This concern was also raised by the Commonwealth Environmental Water Office in their Assessment of the project's business case, that said:

> The CEWO will consider providing water to Yanco Creek system to achieve further environmental outcomes in 2016-17 and beyond, providing this water does not substitute for existing flows in the system that will be removed as part of the SDL adjustment. [16]

CEWH's concerns are likely to be because its water (also called 'held environmental water') is required under the Basin Plan to be in addition to existing water for the environment (known as 'planned environmental water'), rather than a substitute for it:

> A water resource plan must ensure that there is no net reduction in the protection of planned environmental water from the protection provided for under State water management law immediately before the commencement of the Basin Plan.[17]

MDBA was also concerned that the project would worsen environmental outcomes:

> The business case may overestimate the potential ecological benefits of the proposal for a number of reasons as described in Section 4.1 of this advice. Without a refined operating regime the ecological benefits/adverse effects cannot be confirmed and unless it can be demonstrated that the hydrological regime of Yanco Creek is not diminished relative to the benchmark, environmental outcomes for Yanco Creek floodplain should be explicitly scored using the established framework.
>
> Yanco Creek has significant environmental values, including populations of EPBC listed Murray cod and Trout cod remaining in areas of permanent flow. There is a risk that the changed operating regime (with overall lower flows) will result in adverse

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[15] MDBA (2018) *Improved Flow Management Works at the Murrumbidgee River – Yanco Creek Offtake: MDBA Supporting Information,* https://parlinfo.aph.gov.au/parlInfo/download/publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35/upload_pdf/OPD.pdf;fileType=application%2Fpdf#search=%22publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35%22

[16] CEWO (2018) *Assessment of SDL Phase 2 Business Case: Murrumbidgee Effluent Creeks,* Obtained by The Australia Institute

[17] s10.28 *Basin Plan 2012*, https://www.legislation.gov.au/Details/F2012L02240

> environmental outcomes. It is not yet clear that these risks have been comprehensively assessed or how they will be managed.[18]

CEWO raised similar concerns:

> NSW has also advised (at a meeting with the Commonwealth on 5 February 2016) that environmental flows provided to the system will be in accordance with the Yanco creek system environmental flows study. This study recommended maintaining baseflows, enhancing flow variability to promote freshes and maintaining bank full flows. The environmental flows study also identified a potential shortfall of 4GL/yr in meeting the environmental flow recommendations if the existing flow regime continued to be delivered. It is unclear how the current environmental values could be maintained with the reduction in operational losses proposed by the SDL adjustment project. The CEWO considers that any SDL adjustment for this project should be net of the water required to maintain the existing environmental values, otherwise the project risks not delivering the anticipated ecological outcomes.[19]

In other words, both MDBA and the CEWO fear that the proposed changes to the Yanco Creek System will reduce water for the environment and cause environmental damage. To maintain the same values, CEWH will have to restore the reduced flows, which would be a breach of the Basin Plan. It appears certain that the proposed project will keep more water in the Murrumbidgee and provide less water to the Yanco Creek System. The Murray river is likely to get less water as well.

[18] MDBA (2018) *MDBA Analysis of the Improved flow management works at the Murrumbidgee Rivers – Yanco Creek Offtake proposal business case,* https://parlinfo.aph.gov.au/parlInfo/download/publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35/upload_pdf/OPD.pdf;fileType=application%2Fpdf#search=%22publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35%22

[19] CEWO (2018) *Assessment of SDL Phase 2 Business Case: Murrumbidgee Effluent Creeks,* Obtained by The Australia Institute

Supply measure and increasing extraction

If the water diverted from the Yanco Creek System and channelled into the Murrumbidgee is preserved for the environment, there will be a transfer of environmental water from the Yanco Creek System to the Murrumbidgee. However, without adequate provisions to protect environmental water from extraction, the result could increase irrigation extractions and reduce water available for the environment in the Murrumbidgee as well.

MDBA was concerned that the project would worsen environmental outcomes and increase extractions for irrigation by more than the proposed savings:

> The Yanco modernisation project results in less return flows to the river and greater diversions.[20]

Under the Basin Plan Basin states are required to implement policies to protect environmental flows throughout the length of a river, between rivers, and be protected from extraction, re-regulation or substitution, by 30 June 2019.[21] MDBA had assessed the states' policies as 'in effect'.[22] However, the NSW policy will only guarantee delivery of environmental water to the first site that can be measured accurately (ie., by a meter or a gauge in a place where water flows through a well-defined channel; not through areas where rivers often flow overbank, such as wetlands).[23] NSW will not guarantee delivery to sites downstream of the accurate measurement point:

> Environmental water holders ordering water to multiple sites along a delivery path are debited differently depending on the location of the first inaccurate measuring point. Upstream of this point, inflows and outflows can be accurately measured and in-stream losses are socialised as is the case with all other water users. Downstream

[20] MDBA (2018) *MDBA Analysis of the Improved flow management works at the Murrumbidgee Rivers – Yanco Creek Offtake proposal business case,* https://parlinfo.aph.gov.au/parlInfo/download/publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35/upload_pdf/OPD.pdf;fileType=application%2Fpdf#search=%22publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35%22

[21] NSW Department of Industry (2019) *Pre-requisite Policy Measures: Addressing the Guidelines,* https://www.mdba.gov.au/sites/default/files/pubs/New%20South%20Wales%20Overview%20Report-Addressing%20MDBA%20Prerequisite%20policy%20measures%20guidelines%20criteria.pdf

[22] MDBA (2019) *MDBA Communique 2-3 July 2019,* https://www.mdba.gov.au/sites/default/files/pubs/190702-Authority-communique.pdf

[23] NSW Department of Primary Industry (2017) *NSW Prerequisite Policy Measures Implementation Plan,* Obtained from MDBA under FOI 97

> of this point the in-stream losses are not socialised but rather are part of the debit associated with the order.
>
> Starting at the first downstream environmental site that cannot be accurately measured, larger uncertainty is introduced due to estimated use and, as a result, there is also uncertainty with associated in-stream losses of return flows downstream of that point. Therefore the environmental water order will need to wear the in-stream losses associated with the delivery of the water downstream of that point, rather than the in-stream losses being socialised.
>
> The river operators will do their best to deliver the environmental water to other downstream environmental sites, and protect the return flows from orders and re-regulation for non-environmental purposes. However, the river operator will not guarantee the volume and timing of water downstream of the delivery point.[24]

In this case, the hydrological model predicts that the Yanco Creek supply measure will achieve better flows, and therefore better environmental outcomes, in the mid and lower Murrumbidgee. However, this ignores the likelihood that Yanco Creek water may not be delivered to environmental sites, as it could be extracted by irrigation on the Murrumbidgee downstream of Yanco Creek.

SUPPLEMENTARY FLOWS

The extraction of Yanco Creek System water could occur through increased use of supplementary flows. Supplementary flows are flows that cannot be regulated by river operators and are an important part of flows in the Murrumbidgee. Holders of supplementary flow licences can legally extract supplementary flows, but with little infrastructure available to capture and store supplementary water on a large scale, these licences have historically not been fully used. Supplementary flows are particularly valuable for the environment as they are near-natural flows. They occur at a time of year when high flows would naturally occur, are the right temperature and include nutrients and chemical traces that trigger native fish breeding.[25] The Murray-Darling Basin Authority has prioritised adding environmental water to supplementary flows for efficient and effective environmental watering.[26]

[24] NSW Department of Primary Industry (2017) *NSW Prerequisite Policy Measures Implementation Plan,* Obtained from MDBA under FOI 97

[25] MDBA (2013) *Constraints Management Strategy,* https://www.mdba.gov.au/sites/default/files/pubs/Constraints-Management-Strategy.pdf

[26] MDBA (2015) *Basin-wide Environmental Watering Strategy,* https://www.mdba.gov.au/sites/default/files/pubs/Final-BWS-Nov14_0816.pdf

Major changes to supplementary flows are proposed under a new Water Resource Plan (WRP) for the Murrumbidgee, currently being prepared.[27] In particular, the draft WRP proposes to convert 'Lowbidgee' supplementary licences that can only be used in the Lowbidgee area (in the lower reaches of the Murrumbidgee) into supplementary licences that can be extracted upstream of the Lowbidgee area.[28]

There are currently 198,780 ML of supplementary water licenced in the main Murrumbidgee. In contrast, there are 747,000 ML of Lowbidgee supplementary water.

The latest draft Water Resource Plan proposes one class of supplementary water, combining the 747,000 ML of Lowbidgee supplementary licences with the 198,780 megalitres of supplementary licences upstream. This is a total of 945,780 megalitres to be extracted anywhere in the Murrumbidgee.

CEWH currently holds 393,117 ML of Lowbidgee supplementary water. Once converted to general Murrumbidgee supplementary water, this will leave an additional 353,883 ML that can be extracted outside the Lowbidgee, should that remain in the final Water Resource Plan. That is, the proposed redefining of Lowbidgee supplementary licences will significantly increase the opportunities for supplementary flows to be extracted and stored in the new, very large, on-farm storages above the Lowbidgee.

If water that used to flow down the Yanco Creek System is instead kept in the Murrumbidgee, supplementary flows will increase, simply because there is more water in the Murrumbidgee.

Modelling equivalent environmental outcomes

The Basin Plan outlines the process to assess the environmental equivalence of proposed supply measures. This is done by comparing hydrological models. It does not include physical observation of the environment, or consultation with local stakeholders.

The original hydrological model used for the Basin Plan is called the benchmark model. This model was adjusted for the supply measure projects. The adjusted model is then compared to the original benchmark. This comparison between the models should show equivalent environmental outcomes.[29]

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[27] NSW Government (2019) *Draft Murrumbidgee Surface Water Resource Plan components for consultation,* https://www.industry.nsw.gov.au/water/plans-programs/water-resource-plans/drafts/murrumbidgee-surface/components

[28] NSW Government (2016) *Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016,* https://www.legislation.nsw.gov.au/#/view/regulation/2016/367/part9

[29] s7.15 *Basin Plan 2012*, https://www.legislation.gov.au/Details/F2012L02240

Equivalent environmental outcomes are assessed by an environmental equivalency test. They are based on the same hydrological models used to develop the Murray-Darling Basin Plan.[30] Flow statistics at hydrological indicator sites were used as proxies for environmental requirements in the Basin Plan's hydrological modelling. Flow statistics are the frequency, duration and interval of various flow targets that are assumed to achieve certain environmental outcomes.

At its simplest, the environmental equivalency test compares the environmental requirements (represented by flow statistics) of the original Basin Plan hydrological indicator sites against the environmental requirements at the same sites in the Basin Plan hydrological model revised to include the supply measures.

However, there were no environmental requirements defined for the Yanco Creek System in the Basin Plan modelling. The only hydrological indicator site in that system is at Darlot, near Moulamein, but

> no requirements have been defined for the Billabong Creek at Darlot hydrologic indicator site.[31]

That is, it was not possible for MDBA to assess that the Yanco Creek System supply measure would achieve 'equivalent environmental outcomes' because environmental outcomes were not measured in the Yanco Creek System in the first place.

MDBA encountered the same problem when they assessed a supply measure at Menindee Lakes, because there was also no hydrological indicator site at Menindee in the original Basin Plan modelling. Bret Walker SC, the South Australian Royal Commissioner into the Murray-Darling Basin Plan said this about the lack of an environmental equivalence test:

> It follows that there must be serious concerns as to the lawfulness of the Menindee Lakes Project as a supply measure under Chapter 7 of the Basin Plan. There is no basis, in the materials or the evidence before the Commissioner, to support a finding that the MDBA could have been satisfied that the Menindee Lakes Project achieves 'equivalent environmental outcomes' as compared with the benchmark environmental outcomes. On the contrary, the Commissioner finds that no such analysis has been done, contrary to sec 7.17 of the Basin Plan.
>
> As noted above, in its own analysis the MDBA states that the Menindee Lakes Project 'falls outside the SDLAM framework for testing environmental equivalence'. If this is a suggestion that it was unnecessary to consider sec 7.15(1)(c) of the Basin Plan, it is

[30] MDBA (2014) *Fact Sheet: Environmental Equivalence Test (for SDL adjustment assessment),* https://www.mdba.gov.au/sites/default/files/pubs/Environmental-equivalence-factsheet.pdf

[31] MDBA (2012) *Hydrological modelling to inform the proposed Basin Plan: Methods and results,* https://www.mdba.gov.au/sites/default/files/pubs/Hydrologic_Modelling_Report.pdf

> plainly incorrect. There is no special exemption that applies to the Menindee Lakes Project that would preclude its consideration under that section.
>
> If this is a suggestion that somehow the Menindee Lakes falls outside the 'applicable method' to calculate environmental equivalence as outlined in Sched 6 of the Basin Plan, this is also plainly incorrect.
>
> If, contrary to the conclusions reached above, the Menindee Lakes somehow do not require environmental equivalence analysis and demonstration, so much the worse for the Basin Plan. It would be a radical fiction completely alien to the core purposes and processes of the Water Act.[32]

The Yanco Creek System supply measure is subject to the same criticism as the Menindee Lakes supply measure, in that testing environmental equivalence is impossible without a proper modelled baseline under the Basin Plan. It could be subject to a legal challenge.

Modelled Losses

The hydrological modelling to assess the Yanco Creek System supply measures was undertaken by the NSW Department of Industry (DPI) and the MDBA. The early modelling did not show material savings from 'transmission losses', as described in the business case for the supply measure:

> The calibration in the 2005 and 2007 versions of the Water Sharing Plan models uses very flat flow – loss curves to simulate transmission losses in Yanco Colombo Billabong Creeks (i.e. the loss is the same even if the flow doubles). This means any long term reduction flow through the creek system through efficiency or using irrigation corporation escapes produces little simulated benefit.[33]
>
> This threatened the justification of the savings from the supply measure, because savings from 'transmission losses' were too low. To overcome this, DPI and MDBA simply changed the benchmark model to increase the savings: DPI Water have recalibrated the loss functions in the Yanco Colombo Billabong system to produce updated functions and new residual catchment inflow time series. The updated loss

[32] Walker (2019) *Murray-Darling Basin Royal Commission Report,* https://www.mdbrc.sa.gov.au/sites/default/files/murray-darling-basin-royal-commission-report.pdf?v=1548898371

[33] NSW Department of Primary Industries: Water (2015) *Business case for modernising supply systems for effluent creeks – Murrumbidgee River: A Sustainable Diversion Limit Adjustment Measure, ,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

> functions are more sensitive to change in flow and are expected to produce a more realistic transmission loss assessment.[34]

However, changing the benchmark model when determining supply measure savings is not allowed under the Basin Plan and is therefore unlawful.

When assessing savings from supply measures, the MDBA is required under the Basin Plan to use the benchmark model modified only by:

> i. The addition of the notified supply measures; and
>
> ii. The removal of any unimplemented policy measures.[35]

There is no provision in the Basin Plan to amend the model in the event that the benchmark model contains errors or that the modelled results do not yield the results that were expected or required to justify a supply measure project.

In other words, the original modelling did not estimate a water saving to the liking of the water authorities, so the modelling was changed to make it more acceptable. This is a breach of the method set out in the Basin Plan and could also be subject to a legal challenge.

Adequacy of environmental equivalency test

The SA Royal Commission was also highly critical of the reliance on modelling to assess environmental equivalency and believes that it is not lawful:

> In order to be satisfied that the supply contribution from supply measures 'achieve equivalent environmental outcomes compared with benchmark environmental outcomes', the MDBA cannot simply assess modelling results. It requires a substantive assessment. Real environmental outcomes are at stake. Leaving aside the clear text of the Basin Plan, as a matter of policy, modelling should not be preferred over empirical observation. Reliance only on modelling — which is the approach taken by the MDBA — is unlawful and inconsistent with the Basin Plan.
>
> The Ecological Elements Scoring Method in Sched 6 of the Basin Plan, and the modelling undertaken by the MDBA, have alarming shortcomings. These are in part identified in the Ecological Elements Report. The shortcomings of the 'default

[34] NSW Department of Primary Industries: Water (2015) *Business case for modernising supply systems for effluent creeks – Murrumbidgee River: A Sustainable Diversion Limit Adjustment Measure, ,* Obtained through OPD no. 798, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22publications/tabledpapers/c2508f17-13bd-49a9-85eb-6f0436b70763%22

[35] s7.15 *Basin Plan 2012*, https://www.legislation.gov.au/Details/F2012L02240

> method' are particularly notable in the context of the assessment of floodplain forests and fish species.
>
> The reviews of the MDBA's SDLAM modelling and the Ecological Elements Scoring Method are highly qualified, are critical of key aspects, and have limited scope. They fall far short of any supposed wholesale endorsement of the approach taken, as claimed by the MDBA. Those reports establish that the Ecological Elements Scoring Method and the modelling behind it is both experimental and unprecedented. There is a great deal of uncertainty in the results produced by the modelling, and consequently there is a substantial 'error space' inherent in the modelling. As a consequence, on the evidence before this Commission, the current Ecological Elements Scoring Method and the modelling behind it is inconsistent with the requirement that the MDBA have regard to the principles of ESD. Further, based on the comments by the Independent Reviewers, and by other scientific experts before the Commission, there is real doubt whether the supply measure SDL adjustment process can be considered to be based on 'the best available scientific knowledge'. At this stage, the supply measure contribution, which can represent up to a 543 GL increase in the Basin-wide SDL, appears to be the result of a highly uncertain experiment with the environment of the Basin. That is not consistent with the requirements of the Water Act.[36]

In other words, computer modelling of environmental impacts is not a substitute for on-the-ground study of these impacts. Making environmental policy based on modelling rather than observation and wider study is poor policy and probably unlawful.

Community concerns

In its assessment of the projects, MDBA noted:

> The community on the Yanco system benefit from having flood country watered. The community will need to be consulted in relation to the loss of the high flows once the regulator is installed. This is a social issue and NSW needs to demonstrate in its business case that this issue is addressed.[37]

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[36] Walker (2019) *Murray-Darling Basin Royal Commission Report,* https://www.mdbrc.sa.gov.au/sites/default/files/murray-darling-basin-royal-commission-report.pdf?v=1548898371

[37] MDBA (2018) *Improved Flow Management Works at the Murrumbidgee River – Yanco Creek Offtake: MDBA Supporting Information,* https://parlinfo.aph.gov.au/parlInfo/download/publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35/upload_pdf/OPD.pdf;fileType=application%2Fpdf#search=%22publications/tabledpapers/1c583c50-c828-4334-98f4-db01a74c7a35%22

The Yanco Creek and Tributaries Advisory Council Inc. (YACTAC) has summarised several concerns it has with the projects:

> [The (Murrumbidgee) Water Resource Plan] is being prepared without clear transparency about the proposed operating rules to be implemented following the completion of the projects and the impact changes incorporated into the WSP [Water Sharing Plan] now will have on the system in the future.
>
> YACTAC requires assurance that [protection of environmental water] rules will only apply to held environmental water orders and will have no impact on historic accessibility and reliability of supplementary flows or allocations.
>
> YACTAC requires assurance that access to allocation or supplementary flows, or equivalent volumes based on historic modelling, will not be negatively impacted.
>
> Without rules requiring minimum daily flows at the top of the system there is community concern that the end of system flows will be met through the alternate supply routes described in the Effluent Creeks project, which could lead to the upper section being stranded. It is vital to the health of the whole system that the WSP includes minimum daily flow limits at both the Yanco Creek offtake as well as Darlot to ensure whole of system flows.
>
> YACTAC is concerned that water quality issues such as quality of inflows from irrigation corporations or issues of maintaining suitable levels of electrical conductivity (EC) and oxygenation to maintain water quality within the system.
>
> YACTAC requests a review of multiple years across a range of water availability scenarios to get a true picture of what the average transmission "losses" may be.
>
> YACTAC is of the view that any operational surpluses realised through the project should remain within the YACTAC system to underpin allocation and supplementary access reliability.
>
> The Effluent Creek proposal identifies ongoing costs, to be recovered through annual water charges determined by IPART, of:
>
> - Bulk water charges for deliveries through the irrigation corporations;
> - Additional operational costs to implement the new systems;
> - Ongoing maintenance costs.
>
> YACTAC requires assurance that ongoing operational and maintenance costs resulting from the Yanco System SDLAM proposals will be socialised across the Murrumbidgee Valley as the projects benefit the operation of the whole system.

> YACTAC has not had any meaningful consultation on these SDLAM proposals since the early conception stages in 2013/14 – at which time we were told verbally the plan was to use the Yanco Creek offtake to shut the creek down (close completely) for at least 10 days every year. The business cases, while they do not specifically include this aspiration, also do not categorically deny it.
>
> This lack of consultation has led to significant community concern about what the projects actually mean for the creek system, water users and the community for which the system provides important amenity.[38]

YACTAC recently surveyed its members about their understanding and concerns about the supply measure project, and their opinion of the consultation with the community. Over 300 responses showed:

> 85% of respondents have poor understanding of the projects.
>
> 90% of respondents consider consultation to be appalling or disappointing.
>
> 86% of respondents have no confidence in the department responsible for the projects.
>
> 88% of respondents have moderate or high concern about the projects.[39]

The impressions of the Yanco Creek System community are not isolated. Many communities across the Basin have complained about lack of consultation, transparency and integrity around water management and the implementation of water reforms.

Phillip Glyde, the CEO of the MDBA recently met an invitation-only group of community members in Menindee (Lower-Darling/Baaka) about the Menindee Lakes supply measure project. Broken Hill's Barrier Daily Truth reported about that meeting:

> Mr Glyde sympathised with the locals' suspicion that their objections to the Menindee Lakes project and their recommendations would be disregarded and the works forced through, just like the Wentworth pipeline.
>
> He urged then to keep consulting with the NSW Government.
>
> "We want a much more efficient operations for the Menindee Lakes system for a happy community and a happy environment" Mr Glyde said.

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[38] YACTAC (2018) *Water reform concerns*, Obtained by The Australia Institute

[39] Yanco Creek and Tributaries Advisory Council Inc. (2019) *YACTAC Newsletter: Autumn 2019 Volume 1, Issue 6,* https://landcare.nsw.gov.au/groups/yanco-creek-and-tributaries-advisory-council/newsletter-autumn-2019-compressed-images.pdf

> Unfortunately, we can't commit to that but what we can do is encourage you to participate in the process…bring forward your ideas" he said.
>
> "I know there is not much faith in the New South Wales Government, and I can see why you're sceptical (but) if you pull out, they're still going to go ahead with it."[40]

Based on the experiences of communities such as those in the NSW Murray and Lower Darling/Baaka, the Yanco Creek System community is right to be concerned.[41]

[40] Brealey (2019) *Basin Plan benefits in* https://bdtruth.com.au/main/news/article/11781-Basin-Plan-benefits-in-20-years.html years

[41] See Slattery and Campbell (2019) *Southern Discomfort: Water losses in the southern Murray Darling Basin*, https://www.tai.org.au/content/southern-discomfort-water-losses-southern-murray-darling-basin; Slattery and Campbell (2018) *Trickle out effect: Drying up money and water in the Lower Darling*, https://www.tai.org.au/content/trickle-out-effect

Supply measures 2024 reconciliation

The Basin Plan requires the MDBA to assess the supply measure projects in 2024. If this assessment finds that the projects are not able to deliver the promised water savings, the Commonwealth is supposed to make good any shortfall through water buybacks.

This is problematic for several reasons.

First, this is at least four years away. None of the supply measure projects have commenced and delays are common in the implementation of water reform. Many years of negative effects could be inflicted on the environment and communities of the Yanco Creek System before this assessment is even carried out.

Second, given the measurement difficulties in the Yanco Creek System described above, it is unclear how stakeholders can have faith in the 2024 assessment and its reconciliation against the various results modelled in the planning of the supply measure project.

Third, the Water Act currently limits water buy-backs to 1,500 gigalitres, which has already been reached, and the Basin Plan sets the SDLs and by default water recovery targets. Buybacks to compensate for failing supply measures will require Amendments to the Water Act and the Basin Plan before the Commonwealth can buy any water for the environment. Changes to the Water Act need to pass both houses of parliament. Changes to the Basin Plan will need to survive potential disallowance motions in either house. Given the current parliamentary opposition to further buybacks, with support for more buybacks amongst major party MPs either non-existent or never expressed, it is highly unlikely that the necessary amendments would be passed.

Compliance with Cap/SDL

Basin Governments have agreed to limit annual extractions by valley to an annual target called Cap (or SDL once the Basin Plan is fully implemented). If extractions grow in one part of the valley, they need to decrease somewhere else in the valley to ensure overall extractions stay within Cap.

That is, increased irrigation extractions in the Murrumbidgee are allowed, provided that irrigation is decreased by the same amount elsewhere in the Murrumbidgee (which includes the Yanco Creek System).

The water in supplementary flows are especially favourable for riverine and wetland ecosystems because they are near natural in terms of timing, temperature, nutrients and quality. The MDBA has identified adding environmental water to supplementary flows as a strategy to improve environmental outcomes.[42] Extracting more supplementary flows, even within Cap, will worsen environmental outcomes.

[42] MDBA (2014) *Basin Watering Strategy,* https://www.mdba.gov.au/sites/default/files/pubs/Final-BWS-Nov14.pdf

Conclusion

Calling the Yanco Creek System 'effluent creeks' shows a cast of mind that considers the system as waste, pollution or sewage. What right minded person could not support the modernisation of an 'effluent' system? The name certainly does not evoke an ecosystem, people or communities worthy of preserving.

Like most of the rhetoric used in the implementation of the Basin Plan, the words used diverge widely from reality.

The 'savings' achieved by reducing operational surplus and transmission losses are robbing the Yanco Creek System environment, most likely for irrigation in the Murrumbidgee.

The MDBA has rebadged a desk-top hydrological modelling exercise as 'equivalent environmental outcomes'. In the opinion of the South Australian Royal Commissioner, this is unlawful.

When the desk-top study model failed to produce a high enough 'saving', the model was changed to retrofit the desired saving. This contravenes the Basin Plan and is also likely to be unlawful.

Equivalent Environmental Outcomes are measured by comparing a modelled 'before and after' of the proposed project. However, there is no Yanco Creek System 'before' to compare against the 'after'. This makes achieving environmental equivalency easy. So easy, it is impossible to fail. In the opinion of the South Australian Royal Commissioner, this is also unlawful.

If this project goes ahead, the diverted water from the Yanco Creek System is likely to increase supplementary flows in the Murrumbidgee and be legally extracted and stored in the new large on-farm storages in the Murrumbidgee, built specifically to capture supplementary flows.

The budget for this project is $84 million, which will simply be another Commonwealth subsidy for irrigation, with new on-farm storages able to extract the additional Yanco Creek System water.[43] In at least some cases, these storages have been built with government subsidy. Webster has received at least $30m from the Commonwealth for the construction of its dams in the Murrumbidgee.

The Yanco Creek System is one of the few examples in the Basin where the condition of the river matches the vision and objectives of the *Water Act* and the Basin Plan. It is the ideal of

[43] Slattery and Campbell (2019) *Dam Shame, the new dams politicians won't talk about*, https://www.tai.org.au/content/dam-shame-new-dams-politicians-won-t-talk-about

‘a healthy, working river,’ to use governments’ own words. It has outstanding social, economic and environmental values because of the stewardship and commitment of the people that live there and manage it. It is an example of what governments claim to aspire to, but rarely achieve. If the supply measure project goes ahead it will destroy the integrity of the Yanco Creek System.