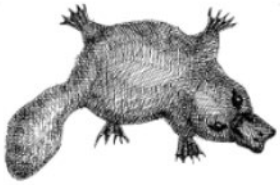
From: [redacted]
To: DPIE W Regional Water Strategies Mailbox
Subject: Water strategy submission from the Winburndale Waters Conservation Group
Date: Saturday, 26 November 2022 1:16:56 AM
Attachments: [redacted]

Please find attached the Winburndale Waters Conservation Group submission to the second draft of the Macquarie Castlereagh Regional Water Strategy.

Also find attached Reports from [redacted] and several submissions to the Proposed change in licence conditions for the operation of the Winburndale Dam. These offer a historic perspective and graphic photographic evidence of illegal low flow regimes under the management of Bathurst Regional Council. Please contact me if further information is required.

[redacted]



Winburndale Waters Conservation Group

A collective of concerned locals who live along the Winburndale Rivulet and want to see it thrive

Summary

The section of the community of Bathurst who reside below the Winburndale Dam recently had to directly face the effects of what has been described as the worst drought in living memory. Their businesses were impacted from the first month of rainfall deficit. By the time the town of Bathurst had imposed the first water restrictions local farmers had already started destocking and hand feeding. This means their potential income had been drastically reduced and their costs in many cases doubled. On top of this at the eleventh hour their drought proof water supply was diverted to Bathurst City to water sporting fields, parks and gardens and to supply industry of Bathurst, not one litre went to residential supply. Is this critical water??

Landholders had to watch the living ecosystem of the Winburndale Rivulet and valley die. This is their workplace and home. Years of environmental stewardship and projects to improve the riparian zone were destroyed. [redacted] conducted an ecological survey and produced a detailed report. In his expert opinion the water deficit directly caused a local extinction event in the platypus and Rakali populations.

The ability to contribute to the draft Macquarie-Castlereagh Regional Water Strategy was seen by the Winburndale Waters Conservation Group as an opportunity to outline their lived experience with drought, failed water management practice and oversight. It was not about apportioning blame but building a better strategy that would prevent a repeat of an ecological disaster in what should be a thriving lifeboat of ecology in the upper Macquarie catchment.

After highlighting the experiences during the last drought, the second draft of the Macquarie-Castlereagh Regional Water Strategy unbelievably contained the shortlisted action 1.3 which proposes the suspension of environmental releases from the Winburndale Dam during extreme drought. Action 1.3 does not comply with the vision of the Water strategy and creates winners and losers with those who lose the most being the environment and landholders who ironically have traditionally farmed on a rivulet considered a drought proof water supply.

There are other options available that can be brought into the mix that do not involve environmental destruction and the total appropriation of a vulnerable part of the community's legitimate water rights.

Proposed action 1.3

"Operation of Suma Park and Winburndale dams –
Developing triggers and communication protocols for when environmental water releases may need to be suspended from council-owned dams and infrastructure during extreme droughts. To give certainty to both Council and the environment, there may need to be changes to operating licences and water sharing arrangements."

This proposed action 1.3 is contrary to the view of the Hon. Kevin John Anderson, MP Minister for Lands and Water, and Minister for Hospitality and Racing who says in the foreword to the strategy-

"When it comes to managing water in NSW my view is healthy rivers, healthy farms and healthy communities. Not one or the other."

The action mentions both Council and the environment but not the water rights of landholders. It is hard to see how the suspension of environmental water releases could provide any certainty for the environment other than certain death, as experienced during the last drought.

The environmental aims of the Macquarie-Castlereagh Regional Water Strategy are stated below and again Action 1.3 undermines these basic aims.

Our vision for the Macquarie Castlereagh Regional Water Strategy is to support the delivery of healthy, reliable and resilient water resources for a liveable and prosperous region.

The importance of ensuring a high level of water security for towns without compromising reliability for other licence holders was acknowledged.

Reducing the demand for water and focusing on demand management rather than increasing supply, was strongly represented in the feedback.

Actions such as the suspension of environmental flows should not be subject to arbitrary triggers but only evoked by the minister after significant consultation and only in the worst climatic catastrophe. An "environmental flow" ceases to deserve that description if it is turned off every drought at the very time it is needed most.

Critical Human needs

The Winburndale Dam has not been used as a potable water supply for decades. In fact until very recently its water had no connection to the residential filtration plant. The sudden redesignation of this dam as a critical water supply for Bathurst and that both the environment and downstream water users should concede their water (critical for their survival) supply in times of drought should not be contemplated.

Towns should not be able to differentially supply i.e. designate a water supply (the Winburndale Rivulet) as 100% for town domestic consumption under the guise of "critical human water needs" which ranks higher than the environment and stock water then use other available water supplies for industry, parks ,gardens etc. At the time of BRC breaching their conditions of operation for the Winburndale Dam, devastating the Winburndale Rivulet ecosystem and denying landholders of their domestic supply, all the Winburndale supply into Bathurst was non-potable and being used for purposes that rank lower than the environment and rural domestic supply.

From Bathurst Regional Council's website
2.2 Raw Water Supplies 2.2.1 Winburndale Dam Raw Water Supply Winburndale Dam delivers surface water to two raw water reservoirs located in Bathurst via a pipeline that was originally wood stave which is prone to leaks and has been replaced as required over significant lengths The primary uses of raw water supply include irrigation of Council Parks, industrial use and the provision of domestic use in stock watering and irrigation.

Other options

The proposed pipeline from Ben Chifley Dam to Bathurst seems to be the only cost effective solution that solves transmission losses and makes available multiple volumes of the Winburndale capacity in one stroke. Building this pipeline has been postponed due to the population of Bathurst not being great enough to make it viable. Studies quote a population of 54,000 as required. Bathurst Regional Council .id Consulting produces projections of a population of 58,622 by 2041 when planning for future growth. This is 19 years time! And yet the Ben Chifley pipeline is not mentioned as an urgent action on a major water storage.

To quote the draft Macquarie-Castlereagh Regional Water Strategy

"The NSW Government is preparing regional water strategies that will bring together the best and latest climate evidence with a wide range of tools and solutions to manage the water needs of NSW over the next 20 to 40 years."

Climate modelling in the water strategy states -

"The probability of the catchment inflows experienced during the 2017–2020 drought happening again could increase from 1 in 1,000 years to 1 in 30 years by 2070"

Regarding population – Over the next 20 years, of the three main population centres Bathurst, Dubbo and Orange, Bathurst is expected to experience the largest increase of 34%. Under the dry future climate change scenario and current management, Bathurst the frequency of water failure will be 1 in 16 years.

The pipeline distance from Bathurst to Ben Chifley Dam is 17km whilst the Bathurst to the Winburndale Dam is 21km. A pipeline from Ben Chifley Dam to Bathurst allows access to over 18 times as much water when full (1700ML vs. 30800ML). Transmission losses from releases from Ben Chifley Dam to supply Bathurst water are quoted from Bathurst Regional Council as around 75 to 80%. The pipeline would effectively increase available water by this amount (4-5 x). The Winburndale Dam pipeline is budgeted for and planned and yet the price per ML from Ben Chifley Dam is much less. Even at 28% capacity (lowest level during the last drought) Ben Chifley Dam still had over 5 times the total capacity of the Winburndale Dam.
(https://www.bathurst.nsw.gov.au/images/stories/water/Chifley_Dam_Monthly_Storage_graph_-November.pdf)

To be fair, before any water strategy countenances the drastic decision to remove environmental flows or landholders basic stock and domestic entitlements every other option should be exhausted. The below options are all viable and achievable and would remove the need for a cessation of environmental flows in the Winburndale Rivulet.

- The town must be operating on 100% recycled water from its treatment plant for critical human needs. This measure would provide Bathurst with multiples of the daily flow of the Winburndale Rivulet in the peak of drought.
- Council must have been on the highest water restrictions.
- All water strategies such as mandatory rainwater tanks on new dwellings and incentives for the same on existing dwellings must have been implemented.
- All irrigation allocations for water storage supplies to Bathurst must have been set at zero due to the extreme drought.
- The Ben Chifley Dam to Bathurst pipeline must have been built and operating.

- If water entitlements are removed for stock and domestic water, compensation must be paid for alternative water supplies to be implemented in time to be effective.

Action 1.3 is an important precedent and decision that needs broader consultation as to the type of sacrifices the entire community is prepared to make. If extreme measures are required then all water storages should have the same conditions regarding emergency environmental flow suspension.

If the infrastructure is adequate there is plenty of water. Again a quote from the Central NSW JO The reality is that with the right storage and pipe network there is plenty of water for town water supplies for Central NSW communities and to enable substantive growth in high value agriculture- it's just a matter of getting it to the right place, at the right time and for the right price. The key options that have implications for towns in the unregulated Macquarie - Bathurst, Orange, Oberon and Cabonne (options 4, 5 & 6) are very generic and high level given the level of town water security risk.

If all the above is not possible then possibly Bathurst has reached the limits of its growth potential. It is not for the environment to "bail out" insufficient forward planning, water saving strategies and infrastructure.

"Us and them" or- One common problem, one united community finding solutions

There is a disconnect in the thinking that arrived at action 1.3. The rural community needs water security as well as their urban counterparts. This apparent divide is illustrated by the following examples.

The following quote comes from the Central NSW JO submission

"Through their lived experience over the recent drought, Bathurst have concluded that instead of talking about 'day zero', the goal should be no worse than level 4 water restrictions. Once past level 4 restrictions, businesses need to close with the risk being that, in the case of manufacturing businesses for example, they will relocate overseas never to return."

This recommendation basically says that towns should be insulated against any restrictions greater than level 4 but the environment and landholders must bear the full force of the drought if action 1.3 was implemented. The last flows of water belonging to the Winburndale Rivulet would be appropriated to achieve this discriminatory aim. Rural residents on the Winburndale Rivulet and their businesses are treated as second class citizens whose water rights can be removed with the stroke of a pen. This recommendation also dismisses the economic contribution of any farming business on the Winburndale Rivulet to the city of Bathurst. These locally owned businesses helped build Bathurst and contribute massively to its local economy.

Stock water has animal welfare ramifications and should rank more highly than town industry which can be wound down or shut down until supply is renewed. Farming businesses feel the effects of the drought and have already suffered loss of income and the increase in operating costs before the urban businesses notice it at all. By the time drought has set in farm businesses have already cut their stock numbers and been supplementary feeding at great expense. It is the height of arrogance to then argue that urban businesses should only suffer a small reduction in profitability due to water restrictions and that farmers should be the "sacrificial lambs" to provide the extra water for their city counterparts. In many cases this stock water is the water of last resort for native animals as well. Action 1.3 is simply about taking water from one party to give it to another. There appears to be no

cost benefit study on the removal of environmental and stock and domestic water from industries along the Winburndale Rivulet including provision for alternative water and compensation for loss of basic water rights.

There is no definition of Critical Human Needs. How is it possible to assess the prioritising of water access when critical human needs have not been defined? Do community members living outside the city have critical human needs?

The potential of the Winburndale Rivulet

Although generally providing only small flows during drought the Winburndale Rivulet is effectively a very safe water supply. It is a pristine mountain stream in the upper catchment of the Macquarie River. For this reason it should be seen as a self-sustaining refuge for river ecology not the last desperate hope to provide small quantities of water to "save" Bathurst. Likewise native animals in the Winburndale valley also rely on this water source as the water of last resort. The Winburndale Waters Conservation Group would argue that the value of such an ecological refuge has been completely overlooked in the water strategy in favour of attempting to prioritise water to lower catchment refuge pools that will be extremely degraded/contaminated by drought and low or no flow.

Once abundant with platypus, rakali and other wildlife the potential of the Winburndale Rivulet as a refuge has been utilised through the release of Macquarie perch more than 70 years after the species were last recorded in the catchment. 7,500 juvenile Macquarie Perch were released back into the Macquarie River catchment at Winburndale Dam in March 2021.

Water that is not diverted to Bathurst from the Winburndale Rivulet will join the Macquarie River and aid flows to help meet the downstream requirements of Orange.

It is not bad luck or a necessary evil if the DPI and government makes a decision to cut off one section of the community's water claiming it is "for the benefit of all". It is a cognisant and intended decision. To choose this path you must also choose the consequences. Communities must band together in times of crisis. A decision such as this creates "have's and have not's". It is ironic that the ones losing entitlements are the ones who currently have the secure water rights (the environment and stock and domestic supplies).

[redacted]

[redacted]

[redacted]

[redacted]

This submission is written by [redacted] in response to Bathurst Regional Council's (BRC) Environmental Assessment (EA) to NRAR to amend their operating conditions in their Water Supply Works Approval (WSWA) and Water Access Licence for the Winburndale Dam.

Regards

[redacted]

Executive Summary

BRC are proposing in their submission to NRAR to change their operating conditions for the Winburndale dam as stated below.

The following changes are proposed:
• Delete water licence conditions DK3944 and DK3752;
• Insert new condition which reads as follows:
– When the water level in the dam is below its crest level, flows are to be released via the 300 mm valve referred to in condition DK3755, at an average rate of 0.78 megalitres of water per day, adjusted for the following seasonal variation:
• Summer (Dec/Jan/Feb) – 0.65 ML/d;
• Autumn (Mar/Apr/May) – 0.40 ML/d;
• Winter (Jun/Jul/Aug) – 0.90 ML/d; and
• Spring (Sep/Oct/Nov) – 1.17 ML/d.

[redacted]

These proposed changes are completely unsatisfactory for the following reasons;

- The removal of condition DK3944 is removing the mechanism that provides the planned environmental water to the environment. The current condition is a clause that provides a translucent flow into the downstream Rivulet, this will provide all the necessary high flows and environmental triggers for spawning and other environmental needs. The licenced discharge pipe has a capacity of around 35 ML per day, and as 4 ML per day is classed as a fresh, it shows that the current management, if operated as clause DK3944 states, is sufficient to provide enough volume of water without the dam having to spill to provide the required volume for environmental triggers and flushing. BRC's own data shows that the actual spill days is averaging 8.4 days per year, not the 154 days per year in the modelling. This shows that if this water licence clause is removed, then the Rivulet can possibly go years with no flows big enough to flush or create environmental triggers. In addition, if the river has insufficient water to support an ecosystem, there will be no spawning present in the Rivulet to benefit from planned spills.

- The removal of clause DK3752 is removing the safe guard mechanism for the downstream environmental needs and basic land holder rights. As the letter in appendix 1 shows, this condition was included to provide security for the mentioned downstream needs in periods of dry when there have been long periods of little to no flow.

- The fixing of the release rates is removing any flexibility in the system. It provides no safety that the environment with its dependant ecosystems and basic landholder rights can be met even during a slightly dry period, let alone a serious drought.

- It's shown that, the new condition is based on inaccurate modelling and the proposed new average daily release rate is actually 65% less than the average releases from the last 16 years according to BRC's own data.

- This proposed new condition in no way represents the intention and desired outcomes of BRC's current WAL.

- The EA fails to recognise the needs of the environment and basic landholder rights as stipulated many times in both the Water Management Act 2000 and the Water Sharing Plan for the Macquarie Bogan Unregulated Rivers Water Sources 2012.

- The modelling on all levels is flawed to the extent the information cannot be accurately relied on due to the basis of biased analysis and inaccurate modelled data, which is shown as being very inconsistent to the actual conditions and outcomes being experienced at the dam and Rivulet over at least the last 16 years.

- The reports are mainly desktop reports that have been carried out on flawed modelling data, with no ground truthing, with only 3 days of onsite analysis being conducted, when the rivulet was flowing very well. The EA has largely refused to acknowledge the local knowledge submitted in regards to the continual decline in conditions of the

Winburndale downstream of the Dam, even though this knowledge stretches over 2 centuries. Whilst there were 13 downstream landholders that made first round submission representation, these respondents represent ownership and management of over 60% of the Rivulet downstream from the dam.

- The basis for all ecological assessment's must be compared to a time period well before the 2004 date, as it is shown through BRC's own water use data that over this period they illegally withheld just over 18 GL of water from the Rivulet which equates to an average of 3.58 ML per day not being released. This has given a false base to assess from. The ecological assessment must establish a baseline of what the Winburndale would have looked like in regards to the rivers health, and compare this to what the health of the river looks like today, as this is what BRC are proposing to continue.

History of BRC's water access licences for the Winburndale Dam

BRC have been found in breach of their current WAL, specifically condition DK 3944, by NRAR. They have challenged this interpretation and claim that it was a new condition introduced in 2004 and subsequently their EA is based off the assumption that their interpretation is the same as the historical management of water releases before 2004. It is also claimed by Premise that "The licence conditions for environmental release rules remained consistent from 1933 to 2004."

This is incorrect. A letter written on the 25th November 2004, from the then [redacted] to the BRC's general manger illustrates inconsistencies in what BRC have claimed in regards to the history of their WAL. Of note, the letter also specifically makes note of [redacted] The letter states the following;

Please note in particular Conditions (4), (7), and (8) which require release, measurement and reporting of flows and storage levels. These are new conditions which will help to provide a level of transparency to the way the dam is operated and address some of the concerns of downstream landholders. (appendix 1)

This shows that the new licence conditions incorporated in 2004 were 4,7 and 8. The current licence condition DK 3944[1] at the time was condition 3 on the WAL (this is the translucent flow clause), this proves that condition DK 3944 was meant to be in operation from 1993, prior to the WAL being amended in 2004. Consequently, BRC appears to have been in breach of their WAL since 1993.

The condition 4 (now DK 3752) was the new condition added and this letter clearly shows it was added to add water security to downstream of the dam not reduce it. See Appendix A (pg. 37) in the EA for the historic WAL conditions.

BRC's Purpose for Application to Amend WAL Conditions

It is stated that "Specifically, the application seeks to delete operating rules DK3944 and DK3752 as referenced in the current Water Access Licence (WAL), which governs the operation of the dam, and insert a single clearer replacement condition"

It is also stated that "The proposal is concerned with the simplification of the wording of the licence condition rather than proposing any substantial change in volume released"

The above statement is incorrect as proven by above mentioned letter to BRC in 2004. The proposed changes to BRC's WAL are not just a rewording it is a fundamental change in its operating conditions as they cannot use data from over 16 years of illegal water use to justify that their current proposal will not change the amount of water they are releasing.

BRC state in the EA; *"The current rules for environmental releases (taking either interpretation by BRC or NRAR) are difficult to operate due to ungauged inflows and the difficulty in determining daily inflow volumes."*
I fail to see how BRC's unwillingness to put the required infrastructure in to accurately record the inflows is a reason or excuse to change the operating conditions of their licence. *(I can only imagine the authority's response if a private irrigation company tried to use this as an excuse/ reason why they can't operate under their licence conditions).*

Relevant Legislation

The application is being made under section 107 of the Water Management Act (WM Act), clause 29 is also mentioned in the application although it has "Limited relevance".

It is also stated that "A review of other sections of the WM Regs do not identify any other matters of relevance to this assessment."

I do not believe that this is accurate, and legal advice that we have received supports the following. There are a number of other sections under both the Water Management Act 2000 (WM Act) and the Water Sharing Plan for the Macquarie Bogan Unregulated Rivers Water Sources 2012 (WSP) that are relevant to this EA. Clause 13 under the WSP states that the water management principles of the WM Act must be followed. Whilst we understand that BRC has a different interpretation, can you please clearly explain why you believe the following clauses are not relevant in this EA.

The Water Management Act 2000, Chapter 2, Part 1, Division 1, Section 5 (3) under water management principles that;

> *(3) In relation to water sharing—*
> *(a) sharing of water from a water source must protect the water source and its dependent ecosystems, and*
> *(b) sharing of water from a water source must protect basic landholder rights, and*
> *(c) sharing or extraction of water under any other right must not prejudice the principles set out in paragraphs (a) and (b).*

WM Act 2000, 9 Act to be administered in accordance with water management principles and State Water Management Outcomes Plan

> *(1) It is the duty of all persons exercising functions under this Act—*
>
> *(a) to take all reasonable steps to do so in accordance with, and so as to promote, the water management principles of this Act, and*
> *(b) as between the principles for water sharing set out in section 5 (3), to give priority to those principles in the order in which they are set out in that subsection.*
> *(2) It is the duty of all persons involved in the administration of this Act to exercise their functions under this Act in a manner that gives effect to the State Water Management Outcomes Plan.*

[redacted]

WSP, Clause 13 Bulk access regime

(1) This Plan establishes a bulk access regime for the extraction of water under access licences in these water sources, having regard to—

(a) the environmental water rules established in Part 4 of this Plan,

(b) the requirements for water for basic landholder rights identified in Division 2 of Part 5 of this Plan,

(c) the requirements for water for extraction under access licences identified in Division 3 of Part 5 of this Plan, and

(d) the access licence dealing rules established in Part 10 of this Plan.

(2) The bulk access regime for these water sources—

(a) recognises and is consistent with the limits to the availability of water set in relation to these water sources contained in Part 6 of this Plan,

(b) establishes rules according to which access licences are to be granted and managed, contained in Parts 7 and 8 of this Plan, and available water determinations are to be made, contained in Part 6 of this Plan,

(c) recognises the effect of climatic variability on the availability of water as described in clause 14,

(d) establishes rules with respect to the priorities according to which water allocations are to be adjusted as a consequence of any reduction in the availability of water due to an increase in average annual extraction against the long-term average annual extraction limit and long-term average sustainable diversion limit contained in Part 6 of this Plan,

(e) contains provisions with respect to the conditions that must be imposed as mandatory conditions on access licences contained in Division 2 of Part 11 of this Plan, and

(f) recognises and is consistent with the water management principles contained in section 5 of the Act.

BRC's proposal in no way satisfies the above conditions of the WM Act. Whilst the desktop modelling might show there will be no 'limited' effect from proposed changes, the submissions from the downstream landholders clearly show that the environmental needs and the basic landholder rights were not being met for at least the last 20 years. This is the period that BRC have been found to be breaching their WAL, which are the same management conditions they are now trying to get legalised with this proposal.

WSP, Clause 16, Commitment and identification of planned environmental water

Water is committed and identified as planned environmental water in these water sources in the following ways—

(a) by reference to the commitment of the physical presence of water in the relevant water source,

(b) by reference to the long-term average annual commitment of water as planned environmental water, and

(c) by reference to the water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met.

[redacted]

WSP, Clause 17 Establishment and maintenance of planned environmental water

(1) This Plan establishes planned environmental water in these water sources as follows—

(a) the physical presence of water resulting from the access rules specified in clause 53 of this Plan,

Note—

The rules in clause 53 of this Plan set flow levels below which the taking of water is not permitted. Some limited exemptions apply.

(b) the long-term average annual commitment of water as planned environmental water resulting from compliance with the long-term average annual extraction limit and long-term average sustainable diversion limit as specified in Part 6 of this Plan, and

(c) the water remaining after water has been taken under basic landholder rights and access licences and any other rights under the Act in accordance with the rules specified in Parts 6 and 8 of this Plan.

(2) The planned environmental water established under subclause (1) (a) is maintained by the rules specified in Division 2 of Part 8 of this Plan.

(3) The planned environmental water established under subclause (1) (b) is maintained by the provisions specified in Part 6 of this Plan.

(4) The planned environmental water established under subclause (1) (c) is maintained by the provisions specified in Parts 6 and 8 of this Plan.

The WSP states that the water source must be managed to ensure that environmental needs are met through planned environmental water as well as ensure the basic land holder rights are being met.

The EA does not recognise these conditions in the release calculations.

The WSP calculates the basic landholder rights as 178 ML/year. BRC are proposing to release 284.7 ML per year, this will only leave 106.7 ML for the environment needs. This figure is completely inadequate to ensure that the environment and its ecosystems are maintained, let alone enhanced, as stated in the WSP as being desirable.

Clause 17 (1c) of the WSP, in regards to establishing the planned environmental water for the Winburndale, states that: the amount of water remaining, after accounting for the average long term maximum extraction amount and the basic landholder water rights, is to be allocated to the planned environmental water.

There is a total maximum extraction from the Winburndale of 1758 ML per year. Premise have modelled that there is 4000 ML of inflow per year into the Winburndale Dam, this equates to there being approximately 2242 ML of planned environmental water annually. However, BRC states that under their proposed new conditions that only 106.7 ML will be released per year.

Whilst some of the water needed to meet all of the above requirements can be supplied from the downstream tributaries, it has become very clear from all of the first-round submissions that the majority of this water has to be met from the headwaters of the Winburndale, as when the flow of the rivulet is stopped at the dam, the Winburndale will often run dry.

Secure Water Yield

[redacted]

Premise state in the hydrology report that;

"The secure yield of a dam is defined as the highest annual water demand that can be supplied from the dam whilst meeting the 5/10/10 design rule (time spent in restrictions does not exceed 5% of the time, restrictions should not need to be applied in more than 10% of years and the severity of restrictions does not exceed 10%)."

The EA and proposed new licence conditions have been based around the perception that BRC's secure water yield of 1000 ML has the highest priority for water out of the Winburndale system. The previous mentioned sections under the WM Act and the WSP clearly dispel this perception and prove that the environmental needs and the basic landholder rights have higher priority under normal circumstances.

BRC has provided a secure yield analysis for the Winburndale dam (appendix 2), given that the secure yield of the dam has to meet the above mentioned 5/10/10 design rule and that environmental needs and basic landholder rights must be met first it can be argued that BRC water access licence of 1000 ML/year should be reduced to ensure that it fits the 5/10/10 rule.

Aquatic Ecology Report

An aquatic ecology report was prepared for the EA by EMM. To put it bluntly, this report needs to be completely disregarded and started again. It is completely inaccurate and cannot be used to justify any claims by the BRC proposal for the following reason.

EMM state the following about the proposal they are evaluating;

*"**The proposal is concerned with the simplification of the wording of the licence condition rather than proposing any substantial change in volume released**. However, it is acknowledged that the revision of the licence condition may result in less water being released down the Winburndale Rivulet in alignment with natural seasonal variation, although modelling indicates that any reductions to annual water release volumes will be negligible".*

This shows that the whole Aquatic ecological study was conducted under the assumption that the amount of water being released will not change, just the timing and wording of the conditions around these releases. This is entirely misleading as BRC are basing their historic releases for at least the last 16 years on their illegal management of the Winburndale Dam. Of course, there will be limited change in the aquatic ecology if BRC are to succeed in getting their proposal approved, all it has done is make their illegal management legal.

For an aquatic ecology report to have any weight in the considerations of this proposal it has to be comparing the ecological health from before the mismanagement of at least the last 16 years with the current ecological health, as the current state that has led to the local platypus extinction is what will be guaranteed into the future.

The bias of this report to favour the previous illegal management practices of BRC are again shown, as EMM quite rightfully list a number of potential threats arising from BRC's proposal. These threats are then dismissed on the same basis of no reduction in water releases as stated below by EMM;

"While the above impacts have the potential to occur, given the proposed licence condition is concerned only with the reallocation of water release volumes rather than the reduction of release volumes, there should be no net loss of average water release volume from Winburndale Dam along the Winburndale Rivulet, although it is acknowledged that a negligible decrease in total water volume may occur. However, the potential decrease in released water volume may contribute to cumulative impacts in terms of existing river regulation, in the

context of the alteration of seasonality of flow within an already heavily regulated catchment, which has the potential to apply to some of the threatened habitats, ecological communities, species and populations."

The ecology report also claims there are no threatened species, this is now incorrect as the Department of Fisheries released Macquarie Perch back into to the Winburndale water source around March 2021, as the Macquarie Perch is a threatened species, this must now be taken into account in regards to ensuring there is enough water to ensure its survival down the Winburndale.

EMM also make a list of recommendations on page 71 of the EA, these recommendations do not seem to be recognised by BRC or premise in their submission.

The *Risk Assessment for the Macquarie–Castlereagh water resource plan area, NSW Department of Water,2018, pg114* lists the Winburndale as having a medium consequence rating and a very high risk of zero flows, high risk of base or low flows and a low chance of fresh flows. This must be taken into account when calculating the required water for environmental needs.

This is also covered in the WSP Clause 10, 2 (a & c) Environment objectives.

Modelling

The modelling which has been used in this EA, has not been correlated with the actual data to prove its accuracy, this has led to claims that are inaccurate and misleading whilst giving a false indication on the impact of BRC's proposed licence amendments.

BRC claim that under their historic management and proposed new management, the dam would spill around 154 days per year. BRC's own data that they have provided for the last 16 years shows the dam only spilled 160 days for the entire 16-year period. This equates to an average of 8.9 days spilling per year. Very different from the claimed 154 days per year in the EA.

As well as the marked reduction in actual spill days to the modelled spill days, there is also the fact that in drier periods when the Winburndale is in need of more water to be released to ensure the environment and basic landholder rights are met, the dam does not spill at all. This is again shown in the BRC's water data with there being zero spill days over the drought years of 2017/18/19.

BRC claim that their proposed water releases are in line with the historic water releases into the Rivulet. BRC's own data again shows this to be inaccurate as their daily release figures show there was an average of 2.18 ML of environmental water released per day over the prior 16-year period. This directly contradicts BRC's claims that their proposed new licence conditions will only result in a re allocation of water. Their proposed changes will result in a 65% reduction in the amount of water being released into the rivulet.

BRC have not accounted for evaporation in either the modelling or their water data figures as they claim rainfall on the surface of the dam cancels out the evaporation. This may be correct in a "normal" or average year but in a dry year when the Rivulet systems are at their most stressed, this is inaccurate. In a year of drought or extreme dry weather conditions, it will generally be the case that evaporation is much greater than rainfall, this is due to low or zero rainfall and higher evaporation rates due to hotter periods associated with droughts.

Does BRC have to account for or "own" the evaporation? As it is their water structure that is holding the systems water and causing there to be much greater evaporation than if there was no dam structure in place.

[redacted]

Is the water that falls on the dam surface from rainfall classed as general inflow and therefore needs to be accounted for, or is it claimed by BRC to nullify their evaporation losses from the dam? If it is claimed by BRC to nullify the evaporation losses, it must come under the harvestable water rights with BRC only being able to claim (harvest) 10% of any rainfall that falls onto the dam's surface.

The EA has not checked any of the modelling with what is actually happening and being experienced on the ground. A quick read of the round one submission's or listen to the recording of the public forum held by BRC will quickly point out that what is being claimed in the modelling and EA is not a fair representation of what is actually happening on a day-to-day basis in the Winburndale Rivulet.

It is stated numerous times through the EA and relevant Aquatic Ecology and Hydrology reports that there is very limited literature and data on the previous state and management of the Winburndale. Yet the report relies heavily on the desktop analysis and computer modelling and has largely ignored 2 centuries of local knowledge from the families that have lived along the Rivulet for generations; my family alone has 7 generations and 200 years of family history and experiences that have largely been ignored.

The EA provides no modelling or recognition of the required amounts of water that are needed to ensure the environment and its dependant ecosystems and the requirements of basic landholder rights.

The bias in the report is astounding when the EA states the following;

" Some users indicate the use of separate bores and reticulation for stock and domestic purposes to augment stock and domestic extraction from the Winburndale Rivulet, with information suggesting the installation of bores has increased in the last 10 years on the claim of reduced flows down the Winburndale Rivulet. A review of available bore data (Section 6.7) demonstrates the installation of only three (3) registered bores within 500 metres of the Winburndale Rivulet since 2010, which would appear to refute this claim."

EMM note at **Appendix C** that an increase in the installation of bores:
…has the potential to draw down local groundwater aquifers and result in drying of permanent biota refuge pools, in conjunction with increased land development, drought, river regulation, and climate change

I find it interesting though that the one area that they modelled from the initial round of consultation was, the claim that landholders are more reliant on groundwater. The report was quick to model this and dispute this claim whilst at the same time counter claiming that it's this increase in ground water use that has led to the Winburndale drying up and its ecosystem's dying.

This again was inaccurate modelling as the comment that landholders are more reliant on groundwater cannot be gauged or assessed by the number of new bores within 500m of the Winburndale, as a lot of the properties extend further than 500m from the Winburndale and has not taken into consideration the purchasing of existing bores.

It is quite insulting that the EA tries to make the point that the reason the Winburndale is in such poor condition is that the low flows were caused by farmers using more groundwater, when BRC have been found in breach of their licence conditions for not releasing the required amount water. BRC's own data shows that they have illegally held back an average of 1305ML per year for the last 16 years (excluding the days with no data), that equates to 3.58 ML per day not being released. This figure dwarfs any increase in ground water use by local landholders.

Appendix 1 –

Letter [redacted] Department of Infrastructure &Planning, November 2004, to Bathurst Regional Councils General Manager.

[redacted]

Department of
Infrastructure, Planning and Natural Resources

[redacted]

[redacted]

[redacted]

[redacted]

Please find enclosed a copy of the licence conditions now attached to the licence held by Bathurst Regional Council for Winburndale Rivulet Dam. They are the same as the statement sent to you previously for comment.

I wish to thank you for your cooperation and patience in resolving this matter. With the new conditions in place the dam will be operated in a way that will hopefully provide for more appropriate releases for downstream users and instream requirements.

If you have any questions or comments I can be contacted at the Dubbo office on 68417406.

Yours faith[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Department of Infrastructure, Planning and Natural Resources

CONDITIONS STATEMENT REFERRED TO ON 80SL004674 RENEWED UNDER PART II OF THE WATER ACT, 1912 ON 20-Dec-1993

(1) THE LEVEL OF THE CREST OF THE DAM SHALL BE FIXED AT REDUCED LEVEL 796.75 METRES (STANDARD DATUM).

(2) A PIPE WITH A DIAMETER OF NOT LESS THAN 300 MILLIMETRES, FITTED WITH A STOP VALVE OR OTHER CONTROL DEVICE SHALL BE CONSTRUCTED THROUGH THE DAM OR A 300 MILLIMETRE VALVE INSTALLED AND MAINTAINED IMMEDIATELY DOWNSTREAM OF THE DAM IN THE GRAVITATION MAIN TO THE SATISFACTION OF THE DEPARTMENT OF INFRASTRUCTURE, PLANNING AND NATURAL RESOURCES.

(3) WHEN A FLOW IS ENTERING THE STORAGE OF THE DAM THE VALVE REFERRED TO IN CONDITION (2), SHALL BE SO OPERATED AS TO MAINTAIN A FLOW IN THE WATERCOURSE DOWNSTREAM OF THE SAID DAM EQUIVALENT TO THE FLOW ENTERING THE STORAGE OF THE DAM FOR THE TIME BEING OR THE CAPACITY OF THE SAID PIPE, WHICHEVER IS THE LESSER.

(4) IN THE EVENT OF FLOWS ENTERING THE STORAGE WHEN WATER LEVELS IN THE DAM ARE BELOW CREST LEVEL, THE LICENSEE MUST RELEASE A FLOW THROUGH THE VALVE REFERRED TO IN CONDITION (2) THAT WILL RELEASE:

(A) 20% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT OR;
(B) 50% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT WHEN A DROUGHT DECLARATION HAS BEEN MADE BY THE NSW GOVERNMENT OR;
(C) 80% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT WHEN EXCEPTIONAL CIRCUMSTANCES FUNDING HAS BEEN ANNOUNCED BY THE COMMONWEALTH GOVERNMENT IN RESPONSE TO PROLONGED DROUGHT.

THESE FLOWS ARE ONLY REQUIRED TO BE RELEASED UPON REQUEST FROM THE DEPARTMENT OF INFRASTRUCTURE PLANNING AND NATURAL RESOURCES WHEN INFLOWS HAVE BEEN RECORDED NOT MORE THEN 28 DAYS BEFORE THE REQUEST.

(5) WHEN THE VALVE REFERRED TO IN CONDITION (2) IS OPERATED IN ACCORDANCE WITH CONDITION (4) THE LICENSEE MAY CLOSE THE VALVE WHEN FLOWS IN WINBURNDALE RIVULET HAVE REACHED THE CONFLUENCE WITH THE MACQUARIE RIVER.

(6) IF AND WHEN CALLED UPON BY THE DEPARTMENT OF INFRASTRUCTURE PLANNING AND NATURAL RESOURCES TO DO SO THE LICENSEE SHALL INSTALL IN THE STORAGE OF THE DAM AN AUTOMATIC WATER LEVEL GAUGE AND SHALL IF CALLED UPON TO DO SO FORWARD CHARTS FROM THE SAID REGULATOR AT SUCH INTERVALS AS MAY BE REQUIRED BY THE DEPARTMENT.

(7) THE LICENSEE SHALL RECORD ON A DAILY BASIS RELEASES OF WATER FROM THE DAM INTO WINBURNDALE RIVULET THROUGH THE VALVE REFERRED TO IN CONDITION (2), RELEASES INTO THE DIVERSION PIPE, AND STORAGE LEVELS.

(8) THE LICENSEE SHALL SUPPLY THE RECORDS REFERRED TO IN CONDITION (7) TO THE DEPARTMENTS DUBBO OFFICE ON A YEARLY BASIS IN A FORM AND MANNER APPROVED BY THE DEPARTMENT.

(9) NOTWITHSTANDING CONDITION (8) THE LICENSEE SHALL, UPON REQUEST BY THE DEPARTMENT TO DO SO, SUPPLY THE RECORDS REFERRED TO IN CONDITION (7).

THE WORK SHALL BE CONSTRUCTED AND MAINTAINED IN A SAFE AND PROPER [redacted]
MINIMISE THE POSSIBILITY OF DAMAGE BEING OCCASIONED BY IT, OR RESULTING FROM IT TO
UBLIC OR PRIVATE INTEREST.

End Of Conditions

Note: You are advised that the right to take and use water granted by this entitlement may be varied once the
ments' Murray Darling Basin Water Management and River Flow Objectives Policy has been finalised

[redacted]

Appendix 2 –

Bathurst Regional Councils Secure Yield Analysis for the Winburndale Dam

Winburndale Dam Secure Yield Analysis

Council's interpretation of licence condition:- 1,033ML/annum historical secure yield

Natural Resource Access Regulator's interpretation:- 28ML/annum historical secure yield

Environmental Outflow and Secure Yield Sensitivity:-

Environmental Flow Rule	Historical Secure Yield ML/a	Secure Yield with 1 °C Climate Warming ML/a
4 ML/d	**0**	**n/a**
3 ML/d	**54**	Not modelled
2 ML/d	**443**	**68**
1.5 ML/d	**637**	**335**
1.25 ML/d	**734**	**452**
1 ML/d	**831**	**556**
20% inflow ~0.8 ML/d (Historical release)	**1,033***	**816**
0.78ML Seasonally adjusted	**930**	**674**

*1933 to 2004 is 973/718

[redacted]

Some comments on riparian and environmental flows in the Winburndale Rivulet

1. **To adequately determine the required environmental and riparian flows from the Winburndale Dam, under the control of Bathurst Regional Council, the following would need to be in place and/or considered.**

    1) **Flow inputs into the dam particularly via the Gulfstream and the upper Winburndale Rivulet must be robustly measured in such a manner that a flow rate can be converted into a volume flow (ML/day). Ideally these should be telemetry based systems so that flow in real-time can be accessed by landholders as well as BRC.**
    2) **The development of flow duration curves for the Rivulet above the weir, the percentage of times that flows are recorded from low to high, a catchment water model based on reliable 100-year rainfall data preferably from the Yetholme area.**
    3) **The development of a water balance model which should take into account, flow inputs, loss of water via evaporation under a range of conditions and dam volumes, water leakage, and expected flow releases (BRC, downstream landholders – irrigation rights, riparian and environmental flows), average annual streamflow above the weir, average volume harvested per year, proportion of streamflow harvested.**
    4) **A well-argued public document describing transparent water release strategy/methodology, that meets the requirements of the water sharing plan upstream of the Burrendong Dam, including the need for riparian and environmental flows. These flows need to be of sufficient volume to enable the length of the Winburndale Rivulet from the dam through to the junction with the Macquarie River to be serviced, to ensure that all landholders receive their fair share of water releases as well as meet environmental needs.**
    5) **It should be possible to determined parameters such as dam leakage and the rate of extraneous flows into the dam from non-streamflow sources, et cetera.**
    6) **The method used to determine environmental flows and riparian releases and associated rules need to be based on well understood scientific methods, and not determined on ad hoc historical releases that may have previously been determined by BRC, unless it can be demonstrated that such releases were determined using an appropriate science-based methodology. Ideally such releases should be operated telemetrically.**
    7) **The water sent to Bathurst via the existing pipeline and downstream of the weir need to be measured with a tolerance of +/- 10%. It should be possible to determine what leakages occur from the existing pipeline.**
    8) **The percentage of pipeline flow destinations need to be determined on at least a monthly basis as, water for sporting irrigation purposes would have a lower priority than water destined for human uses. This needs to be transparent.**
    9) **It should be possible to experiment with water releases into the Rivulet under a range of conditions, to optimise flow release regimes.**
    10) **There are limited irrigation rights available to specific landholders and these needed to be honoured when required and considered in the flow determinations. Presumably these would be made on an 'as needed' basis**

11) **Any flow release strategies and associated rules, need to make perfectly clear the priorities of water releases in regards to riparian flows, environmental flows, irrigation flows, and water releases to service Bathurst City (irrigation and human consumption), and the basis for such priotisation.**

2. **As a professional consultant and ecologist I determined the environmental flows required below the Cadiangullong Weir (4200 ML) in the Lachlan Catchment for Cadia Mines and also below the pipe-head Duckmaloi Weir (20ML) in the upper Macquarie catchment for the Fish River System. In the last decade these releases have been modified but I am not aware of the outcomes. Based on that experience I would expect that under normal circumstances, combined riparian and environmental releases down the Winburndale Rivulet would likely be between 2-4 Ml/day. However, whatever the flow rate that is eventually determined, it should be possible to determine experimentally, whether such flows transmit throughout the length of the Rivulet.**

3. **Earlier this year I helped design a pro forma to determine with landholders the presence/absence of platypuses and native water rats along the Winburndale Rivulet. A preliminary assessment of the data which is currently being analysed, suggests that platypuses disappeared completely from the Rivulet downstream of the dam and that the native water rat is likely locally extinct. In my opinion the loss of platypuses, which since the break of drought appear to have re-invaded the rivulet in very low numbers from the Macquarie River, was likely directly attributable to the failure of BRC to release riparian and environmental flows down the Rivulet as required under existing water sharing arrangements. This caused important larger refuge pools to dry out. Under such extreme drought conditions platypuses will attempt to move downstream, are unlikely to have bred, and probably suffered very high mortality rates. It is likely that in the near future that the platypus will be determined under state and federal law to be an endangered species. If and when this occurs this may come with additional water demands. Tis possibility should be kept in mind.**

[redacted]

Critique of Premise's/Bathurst Regional Council Report, December 2021
[redacted]

1. The conclusions of my substantive report: *the* [redacted]

   BRC has maintained a flow deficit in the rivulet for 16 years in breach of its licence condition, in spite of a number of warnings from the regulator. During droughts, flow releases averaging around 0.75 ML/day were unable to maintain a pool-riffle system within a 65 km rivulet in periods of low flow, more so under hot summer conditions when evaporation was optimal. Nor could downstream landholders access their riparian entitlements. Landholder observations over the 50-year assessment period (1970 -2020) have demonstrated the gradual decline of both the platypus and the Rakali from within the rivulet to possible local extinction or near extinction by early 2020. However, it cannot be discounted that small populations of both species still exist within the confines of the dam itself or upstream within the Winburndale Nature Reserve.

   Comment

   (1) My substantive recommendations on p18 have been ignored by Premise. I do note that Premise has made some attempt to better explain what data are included in their silo on which modelling is based. However, as landholders have pointed out the assumptions remain deeply flawed.
   (2) My critique of Premises 2020 report in Appendix 2 of the above report, appears to have been completely ignored. I stand by my criticisms in Premise's first and second iterations. My report is not even acknowledged in the Bibliography in the December 2021 Premise report. Surely the research and opinions of an independent and experienced consultant deserve consideration. I can only conclude that neither Premise nor BRC have adequate answers to the significant criticisms raised in that report.
   (3) My critique of the EMM report on Freshwater Ecology, (Appendix 3) remains unchanged and again no serious attempt has been made to address the issues raised by Cenwest, in spite of a subsequent aquatic ecology survey having been undertaken.

2. I am in full agreement with the current (January 2022) responses by the Winburndale Conservation Group, in their critique of Premise's December 2021 report.

   Further I would note:

   (1) Premise has failed to answer the critical question as to what constitutes a minimum flow rate that will maintain instream ecological integrity and riparian rights for landholders through to the rivulet's confluence with the Macquarie River.
   (2) What BRC is proposing remains non-compliant with the NSW Water Act.
   (3) To ignore evaporation rates from the dam under hot drought conditions in the modelling is completely unacceptable, when such losses from the Dam are substantial under such conditions.

(4) Premise and BRC appear to place more reliance on 'spin' and wishful thinking rather than on actual scientific evidence.
(5) Premise and BRC have continued to ignore determinations of environmental flows in other tablelands streams even though they were provided with such instances.
(6) Critical inflow measurements from two input streams into the dam remain seriously inadequate, given that such technology is readily available to measure such flows, particularly low flows. Furthermore, BRC has a full time ranger living on site who is able to monitor equipment.
(7) On p 20 the claim that the proposed release rules do not result in any significant impacts and meets the needs of the environment are breathtaking given the local extinction of the platypus colony and much more!
(8) No where does Premise assess how their proposed release of 0.7 ML/day would service environmental and riparian needs along a 65km stream under drought conditions.

(9) The significant pipeline leakages of up to 3ML/day are not addressed nor included in the modelling.
(10) There remains widespread concern about the upkeep of the daily logbooks.
(11) The summary of the aquatic Ecology impacts, pp109-110 make no references to Cenwest's submission and criticism, nor the fact that the local platypus population, likely became extinct due to inadequate flow releases under hot summer conditions.
(12) The references provided on pp 116-117 do not include the substantial inputs to the process by independent consultants nor other interested parties!
(13) Appendix D, Ecological Assessment
- The unchanged (?) EMM report does not respond to the criticisms made by Cenwest (2021).
- Does not cite Cenwest's report in the references on pp 216-219 or any other inputs from third parties.
- There is no evidence that they have even read such third party reports.
- Ignores the fact that the release protocols likely caused the extinction of the local platypus population!
- Does not address what constitutes an adequate environmental release in the Winburndale Rivulet.

(14) Appendix E is a supplementary report prepared by EMM, December 2021.
- The points raised in (13) above apply. Nothing to see here is the ongoing attitude and nor is there questioning of the modelling, provided by Premise.
- Again EMM have either ignored Cenwest's 2021 findings or perhaps not bothered to read this paper.
- Appendix E: Depth rating on pp 367-371
  No attempt is made to indicate how this report adds to our understanding of the ecology of the Winburndale Rivulet and no reasons are provided as to whether or not this is another example of hopeful modelling.

(15) Appendix F, Secure Yield and Hydrological Analysis
- Section 5 p 418 – am I right in concluding that allowances for climate change have not been included in the modelling. That would be a

disastrous outcome given the predictions are that stream flows in the Central West are likely to reduce by up to 30% .

- There are serious questions as to the reliability of Premise's modelling, particularly under low flow scenarios when dam evaporation is not taken into account nor the considerable leakages from the Winburndale pipeline.
- The modelling simply does not ring true with the lived experiences of downstream farmers.
- The recommendation that pluviometers should be installed to better determine catchment rainfall is long overdue, not to mention installation of appropriate flow meters that were a licence requirement.
- There is no modelling of flows in the many tributaries of the Winburndale Rivulet.

(16) Appendix L: Communications log

- Parts of Cenwest's extensive report is recorded on pp 770-772, appearing in full on pp 858-904. However, Cenwest's concerns are neither acknowledged nor addressed . Why not?
- Many concerns are raised in the many submissions by interested parties but few of these concerns are adequately addressed in the Premise December 2021 report, and many are completely ignored.

[redacted]

Submission on Bathurst Council's proposed changes to operating conditions at Winburndale Dam.

My [redacted]

I am [redacted] and have lived along the Winburndale Rivulet at Duramana all my life.

I am the third generation of my family to farm here dating back to my Grandfather settling around 1888.

I would like to express my observations regarding the Winburndale and comment on the proposed release amount of 0.78ML/day.

The Winburndale has always been a reliable stream with good biodiversity. The lower section of the Rivulet where I reside has been known for its deep reliable water holes even in times of prolonged dry that supported both livestock and domestic needs and also oak trees, fish and platypus and other animals.

This reliability has always been crucial during drought and has supported the successful, expanding, meat sheep enterprise I conduct [redacted]
Currently we are the largest White Dorper producers in the Central Tablelands District with 800 breeding ewes and hoping to expand too approx. 2000 ewes, producing 3-4000 plus, lambs a year.

It has been alarming to observe both the reliability and biodiversity of the stream gradually decline, most notably over the last 20 years, culminating in a complete collapse in the 3 year dry period of 2017-2019.

In that period water holes that have never previously gone dry ceased to exist in any form. To see them disappear for the first time was an added stress to what we had suffered in previous droughts.

I have never seen, and no one has ever described to me, the Rivulet being as dry as it was in that period even though I have experienced and been told about previous droughts being equally as dry weatherwise.

Sadly, many old growth river she oaks which had survived previous droughts died in this period. Obviously with water holes completely disappearing there was no hope for flora and fauna to survive and watering livestock became extremely challenging.

Unfortunately, even with a return to flow with the recent higher rainfalls, the platypus holes that surround these deep-water holes are not being used so I fear the platypus is now extinct here due to the artificial starvation of the Rivulet.

In light of this observed decline and in response to an invitation by Council, I attended a public forum on March 5.

A new flow release figure of 0.78ML/day had been outlined in Council communications and I had hoped that the forum would provide some information on how that amount compared to the recorded releases during the 2017-2019 period. Unfortunately, when Council was asked about these figures at the forum, they were unable to provide any flow data. They did say they would be able to supply it thereafter.

Since then, fellow landholders have been able to obtain some data from Council. Assuming it is accurate, it indicates that the release average for the 3 years 2017-2019 was 0.88ML/day.

At the forum Council also acknowledged their proposal to remove the condition DK3752 which exists to allow extra releases in times of drought. These releases were unfortunately not carried out by Council during the most recent drought, so no one knows how much they would have helped. Unfortunately, droughts will continue to occur so some special release conditions need to remain (and be carried out) during times of drought.

We now know a release of 0.88ML/day over the 3 years of drought produced the worst conditions experienced in my family's history on the Winburndale. We also know there were no extra releases as condition DK3752 was not implemented. So a release of 0.78ML/day with the removal of condition DK3752 is guaranteed to be an environmental and economic disaster. The actual experiment to prove this was experienced by all those living along the Winburndale during 2017-2019.

Council has recently produced a document (attached) to show that the yield for their Bathurst water license would be too negatively affected by a release amount above 0.78ML/day.

Other landholders have explained to me that the Water Act 2000 states that sharing of water from a water source must first protect that source and its dependent ecosystem as well as fulfill basic landholder rights, outlining that sharing and extraction must not prejudice these. Releasing 0.78ML/day will certainly not protect the Winburndale because 0.88ML/day killed it during 2017-2019.

As outlined earlier in this submission we hope to expand of our White Dorper sheep enterprise, but this will not be achievable without having our basic landholder rights met by the Winburndale Rivulet, which is the only major water source for livestock over approx. 1000 acres of our property.

Even if an alternate water source could be found the considerable cost of water infrastructure may be prohibitive for our business.

Of the dams that are in use here, 50% do not reliably hold water due to the terrain, meaning the construction of more dams at huge cost would be required in an attempt to compensate for the denial of our water rights from the Rivulet. This scenario would ultimately destroy our business and livelihood along with our dreams of being prominent sheep meat producers in this area.

We are currently investing good money in order to achieve our business goals and should Council's submission go ahead everything we are now doing would be to no avail as Winburndale Dam would not provide water security to the Rivulet in times of dry.

The dam held 1800ML on 12 Jan 2019. On 1 Jan 2020, the dam level was 1220ML – which is 67% of Capacity. Inflow of 1214ML was still recorded in 2019 during full drought. The Drought began to break in March 2020.

So during the drought period, especially towards the end (2019) when the effects became most acute there were still inflows (yield) as well as a volume of water available to help protect the water source, ecosystem and provide water security to fulfill basic landholder rights as the Water Act requires.

NRAR has found that Council was in breach of the current license conditions, meaning these conditions were not to blame for the 2017-2019 starvation. That blame rests solely with the management by Council.

Nowhere in the EA has any investigation been carried out to determine what is an actual viable environmental flow in the Rivulet. [redacted] attended the forum. He has local knowledge and expertise regarding viable environmental flows particularly for the health of platypus. It is inconceivable that Council did not seek his input to their EA.

Before allowing Council to alter conditions that were not adhered to anyway, NRAR as the regulator should insist an investigation into actual viable environmental flow is carried out ensuring the Winburndale is properly protected, and that basic landholder rights are met.

Yours sincerely,

[redacted]

[redacted]

[redacted]

Winburndale Dam Secure Yield Analysis

Council's interpretation of licence condition:- 1,033ML/annum historical secure yield

Natural Resource Access Regulator's interpretation:- 28ML/annum historical secure yield

Environmental Outflow and Secure Yield Sensitivity:-

Environmental Flow Rule	Historical Secure Yield ML/a	Secure Yield with 1 °C Climate Warming ML/a
4 ML/d	**0**	**n/a**
3 ML/d	**54**	Not modelled
2 ML/d	**443**	**68**
1.5 ML/d	**637**	**335**
1.25 ML/d	**734**	**452**
1 ML/d	**831**	**556**
20% inflow ~0.8 ML/d (Historical release)	**1,033***	**816**
0.78ML Seasonally adjusted	**930**	**674**

*1933 to 2004 is 973/718

Submission to NRAR/Comments on Premise and Bathurst Regional Council's Environmental Assessment of proposed changes to the Winburndale Dam operating conditions.

As landholder stakeholders we have endured both the complete mismanagement of the Winburndale Rivulet by Bathurst Regional Council (including overdue Dam safety upgrades still not completed), and now the shambolic consultation process regarding an environmental assessment application to change the operating conditions of the dam.

The initial contact from Premise notifying of this process was received only days prior to an announced deadline for submissions. There was minimal detail or context provided on what was being proposed. This is reflected in my initial submission dated 19/12/20.

I would like to make a further submission as the sharing of the report and subsequent Stakeholder Forum has increased awareness of what is being proposed.

I have submitted emails with questions to Council following the Forum. All remain un-answered by Council. I can provide copies of those emails if Council has not already done so.

At the Forum and in a subsequent letter from Premise dated 5 March (attached) a final Submission date of 26/3/21 was outlined.

Firstly my Family's personal account of the Winburndale (as also expressed at the Forum).

The Winburndale has supported my family and our agricultural business at Oakbrook since 1911.

We have no water licence beyond basic stock and domestic rights.

[redacted]

My family's recollection, principally through my father [redacted] is of deteriorating rivulet health, most noticeably in the last 2 decades with 2017-2019 being by far the worst period where the rivulet, even under drought conditions, was abnormally dry and ceased to exist in any viable form for long stretches. This recollection includes generational memories prior to the construction of the dam in 1933.

Environmentally, this deteriorating river health has resulted in us witnessing as a minimum:-

- The death of flora, particularly old growth River She Oaks which line the banks and provide valuable protection from erosion, cooling shade, and habitats for birdlife and reptiles.
- Disappearance of native fauna including platypus and water rats
- Disappearance of native fish species to be replaced by the invasive European carp and their degradational impact.

The following includes critical analysis of sections of the Premise EA prepared for Bathurst Regional Council.

Historical Comparisons.

Executive Summary, Pg2, final paragraphs conclusions of the hydrologic report referencing the original 1933 license conditions. 1933 Conditions, Appendix A, page 50 of pdf

The EA argues that the new proposed environmental release should align with the historical view of an environmental flow set out from the 1930s.

It overlooks the fact that beyond the basic release rules (condition 2), there were further rules for release surrounding 'freshnets' (condition 3) as well as overall discretion of release or non-release that was in the hands of the Water Conservation and Irrigation Commission (condition 5). These historic conditions which allowed for extra releases will not exist with the new proposed conditions and removal of DK3752.

It is also not difficult to highlight a further flaw in this statement, as the EA report already does within itself. I refer to Appendix A, secure yield study, page 3 of 10, pdf page 196 which contains a table that estimates the effect of

climate change (in accordance with DPI Water's "Assuring future urban water security, Assessment and Adaption guidelines for NSW local water utilities") on future yields of the dam. It would be a unique form of climate change that is going to affect the yield of the dam in the future, but have no effect on the required rivulet environmental flow, especially one calculated almost 90 years ago.

Flow Analysis

The Premise EA Report contains a lot of modelling, estimates, and projections but two discernable facts are also included.

Fact 1 From 2004, Council's adopted interpretation that the obligation for environmental releases should be 20% of inflows (p9 Executive Summary).

For the simplicity of argument, we will assume this self-interpreted rule was carried out. NRAR as the regulator will need to establish whether they were compliant with their own made-up rule.

Fact 2 Written (in EA submissions) and Spoken (at the recorded stakeholder forum, March 3rd) evidence from all landholder stakeholders that the Rivers Environmental health has deteriorated, particularly over the past 20 years, culminating with the period 2017-2019 being the worst in anyone's memory, both current and from historic information.

Pg 28 Executive Summary, the new proposed conditions state the new flows are to be seasonally adjusted but end up as a daily avg of 0.78ML/day. (executive summary pg2 and pg15, note it reads Case 4 – Proposed environmental release rule of 0.78 ML/**yr**. It is concerning that from a professional point of view such an incorrect figure of 0.78ML/**Yr** would advance through the 4 draft reviews prior to 15/1/2021 without being corrected)

Pg 9 Executive Summary. Existing Licence Condition DK3752 which had provisions for extra ordinary releases is proposed to be removed due to the outdated wording of the condition. From pg9 The amended condition is inconsistent or at least ambiguous and contains concepts of 'drought declaration' and 'exceptional circumstances', which are no longer valid in government drought policy.

Even though Government terminology used to refer to drought has changed, droughts will continue to exist. That is the nature of Australia, the Earth's driest continent. To simply remove the condition because Government policy wording referencing drought constantly changes is simply an attempt to sidestep responsible action in listing accountable and flexible workable conditions that can be adhered every time a drought occurs. All previous licence conditions have had some provision for above ordinary releases in time of deficit but under this proposed amendment there will be no such conditions to ensure flexible management of the dam in times of deficit or even abundance.

No dam inflow figures have been made available, despite personal assurances to stakeholders by [redacted] BRC representative at the Stakeholder Forum that they would be 'happily' made available. My subsequent emails formally requesting Dam data have not been replied to in any form.

Without this basic dam data there has been no way to contextualize this proposal against actual flow figures that were witnessed during 2017-2019 which produced a state that all witnesses have outlined as an Environmental Disaster.

NRAR as a compliance regulator should have the power to request this basic data. If it has not been recorded, then this is a serious act of non-compliance with recording condition DK3946 (APPENDIX B EXISTING LICENCE pg3) by BRC that NRAR should be publicly prosecuting. If the Data exists, then staff at NRAR have the expertise to analyse it and provide a clear picture of what has been occurring. At least then all stakeholders would have a far more informed view of what is being proposed for the Rivulet and what 0.78ML/d may reflect going forward. If the hard data, referred to above, actually supported the BRC proposal then why did they not use it in their own report to justify the adequacy of a daily 0.78ML release?

According to the Table1 pg15-16 Executive Summary, the spill days are 154 under the current interpretation of the release rules. They are forecast to reduce to 150 days under the new flow rules. So essentially any spill events that have or haven't occurred will match into the future. No extra releases will be required with the removal of condition

DK3752. The health and viability of the Rivulet simply comes down to the adequacy of the proposed release amount of 0.78ML/d.

As a basic assumption, if inflows for the Dam for the 3 year period 2017-19 averaged 4ML per day or higher, then the 0.78ML/day proposed will be less of an environmental flow that was actually occurring in the period 2017-2019 (20% of 4ML is 0.8 which is greater than the proposed new release). In this period, stakeholder witness evidence shows the environmental flow was not adequate.

The Executive Summary pg.15 estimates average daily inflow at 11ML/d with a 4GL/yr total inflow. One could assume that the inflow even during periods of prolonged dry could still be above 4ML/d or 44% of the average. The actual recorded historical inflow figures would clarify everything and save estimations in the EA. Once again, it begs the question as to why the actual data is not being used or provided to stakeholders?

Unless the release was significantly less than 0.8ML/d during the 2017-2019 period, no one could possibly believe that 0.78ML/day is going to be an adequate environmental flow in the future. Even at an inflow of 2.5ML/d which is only 22% of the average 11ML/d, the release would have still been 0.5ML/d (using the 20% formula). It is hard to believe that an extra 0.28ML/d (0.5+0.28=0.78) would make a noticeable difference to what stakeholders have described as an environmental disaster.

Dam storage level changes and the amount transferred each day to Bathurst through the pipeline + evaporation/seepage would also allow the calculation of the daily inflow figures, and therefore release amounts. These also have not been made available.

It would be preferable not to hypothesize regarding all the above calculations but in the absence of actual data there is no choice.

The complete lack of transparency speaks volumes regarding the incompetent and negligent management of the dam (management that every landholder has described as such). I refer NRAR to its own service charter.
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0004/353425/NRAR-Service-Charter.pdf
Our commitment: transparency and accountability.

Bathurst Regional Council refuses to provide requested information to allow all to review their actions and scrutinize their plan. We have been unable to achieve any transparency and accountability for the Rivulet. The time has come for NRAR to keep to its commitment and achieve both on the Rivulet's behalf.

In Conclusion

Serious regulatory effort backed by sound science and hard data needs to be applied to accurately calculate what is actually a viable environmental flow for the Winburndale Rivulet in a potentially changing climate.

From there workable and accountable conditions could be drafted. Proven examples in use at other NSW water storages would provide a good template to begin.

For the health of the Winburndale Rivulet I would strongly suggest NRAR takes appropriate action to ensure this happens.

[redacted]

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Our Ref: Winburndale merge.docx

5 March 2021

[redacted]

Dear Sir/Madam

AMENDMENT TO ENVIRONMENTAL FLOW RULES ASSOCIATED WITH WINBURNDALE DAM

We originally wrote to you during preparation of the Winburndale Dam licence amendment Environmental Assessment to seek feedback on the proposal to amend the licence conditions.

More recently we wrote to you to advise you of the intention to host a stakeholder forum with respect to the Winburndale Dam licence amendment Environmental Assessment.

The EA can be accessed at the below website:

[redacted]

If you have any problems with the [redacted] and we will forward a link to enable download of the document.

If you would like to provide comment on the EA, we would welcome any comments to Premise (email preferred [address above], but otherwise by letter) by close of business **Friday 26 March 2021**. Postal details are at the top of the page.

If you have any questions, please contact the undersigned on 0437 621 057.

Yours faithfully
Premise Australia Pty Ltd

[redacted]

Australian Platypus Conservancy

WINBURNDALE RIVULET ENVIRONMENTAL FLOWS AND THE CONSERVATION OF PLATYPUS AND RAKALI

SUBMISSION TO NRAR

The platypus is recognised as one of the world's most unusual animals - an egg-laying mammal that possesses a genuine 'sixth sense' in its bill and (in the case of the males) is venomous. However, there is serious concern about the apparent decline in numbers of this iconic species in various parts of its range. The conservation status of the platypus was listed as 'Near Threatened' in the most recent CSIRO Action Plan for Australian Mammals (Woinarski, Burbidge and Harrison 2014) and this classification was subsequently endorsed by the IUCN (International Union for the Conservation of Nature) in 2016 (Woinarski and Burbidge 2016). The platypus has recently (2021) been listed as 'Vulnerable' in Victoria and it is possible that the national status might soon be changed to 'Threatened'.

The Australian water-rat/rakali is an attractive native mammal that is an important component of aquatic eco-systems. It is currently regarded as common in most parts of its range. However, it is a difficult species to study and has been the focus of very little field-based research to determine its true status. In fact, considerable anecdotal evidence suggests substantial declines in numbers have occurred in many catchments. Accordingly, a case can be made that its conservation classification ought to be regarded as similar to that of the platypus.

Numerous factors have contributed to the reduction of platypus and rakali numbers in the period since European settlement. However, there seems little doubt that changes to natural flow regimes of rivers brought about by human intervention – particularly the construction of dams for irrigation purposes – has been one of the key drivers of this decline. Populations of both these aquatic mammals are likely to face extreme stress (particularly as a result of reduced feeding opportunities and increased exposure to predation) unless water levels remain adequate for their basic ecological needs.

The Australian Platypus Conservancy is unable to offer a definitive assessment on the current status and distribution of platypus and rakali populations in the Winburndale Rivulet, given the absence of requisite field-based survey data. However, considerable and compelling anecdotal evidence suggests that both species have declined significantly and may be facing local extinction (Cenwest Environmental Services 2021). In the absence of a clear alternative explanation it would seem reasonable to conclude that the historical low flow along the Rivulet in the past 20 years or so has been the primary cause of this decline.

In very general terms, the 2011 NSW Office of Water/NRAR release strategy provides for higher average daily flows compared to the BRC proposed-model and, as such, should theoretically provide better conditions for platypus and rakali. Whether even the NRAR level is adequate to enable rapid recovery in platypus numbers is questionable and should be subject to further detailed investigation.

It is recognised that the NRAR conditions may cause considerable difficulties for BRC in meeting its water supply targets. However, this is a problem that many management agencies will have to solve if the needs of an increasing human population are not to overwhelm natural resource values in Australia and threaten the survival of many taxa of native fauna and flora.

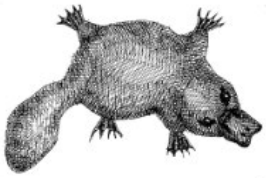
Accordingly, BRC should be proactive in developing more sustainable methods of delivering domestic water supplies, such as enhanced permanent restrictions on household and commercial water usage, mandated regulations for water tank installation at all domestic and non-domestic premises, and a commitment to civic stormwater harvesting and water recycling systems.

References:

Cenwest Environmental Services (2021). The Distribution, Abundance and Conservation Status of the Platypus and the Rakali (Water-rat) in the Winburndale Rivulet. Report to the Winburndale Waters Conservation Group.

Woinarski. J C.Z., Burbidge, A.A. and Harrison, P.L. (2014). *The Action Plan for Australian Mammals 2012*. CSIRO Publishing. Collingwood VIC.

Woinarski, J. and Burbidge, A.A. (2016). *Ornithorhynchus anatinus*. (IUCN Red List of Threatened Species).



Winburndale Waters Conservation Group

A collective of concerned locals who live along the Winburndale Rivulet and want to see it thrive

Comments by the Winburndale Waters Conservation Group on-
WINBURNDALE DAM WATER SUPPLY WORKS APPROVAL - AMENDMENT FOR CLARIFICATION OF CONDITIONS
Report No: 221135/EA
Rev: 001G
3 December 2021

The Winburndale Waters Conservation Group stands by its initial comments in its submission regarding the first version of the Premise EA. Although our concerns have been noted and referred to in this second EA the basic documented facts presented have not been addressed. More desktop modelling has been produced to try and gloss over the irrefutable fact that the assessments suggested flow regime (0.78ML per day average) is grossly inadequate and has been proven so historically.

Further to our initial responses we again summarise below our key objections to the EA and its methodology.

The Bathurst Regional Council suggested amendments to the operating conditions of the Winburndale Dam are not compliant with the Water Act. Compliance must include protecting the water source and its dependent ecosystems and protecting basic landholder rights. Unbelievably the EA does not contain an environmental assessment of the optimum environmental flow requirements of the Winburndale Rivulet or the water rights of downstream users. BRC are simply undertaking a comparison between the historical release regime which they freely admit was inadequate during the last drought. The new proposed fixed release rate is actually less than this historic release rate.

There are major factual inaccuracies in the Assessment that render it invalid. These include but are not limited to;

1. Aquatic Ecology Assessment Comments in the EA continue to suggest that release of flows from the dam are ineffective in supplying flows downstream particularly below the confluence with St Anthony's Creek. There have been several occasions where flows have been requested by the then regulator, analysed and the successful progress of such releases for kilometres downstream noted and reported to the regulator. This occurred at and below this very location. The incongruous relationship between the modelling and observed facts renders the desktop guestimates made by EMM worthless.
2. The hydrology study erroneously suggests that there is a disconnect between "…catchment flows upstream of the dam and the catchment flows downstream of the dam." See point 1.

3. BRC's obsession with its secured yield is irrelevant in establishing the conditions of operation. Under the water act a secured yield is ***only*** available after the environmental flows and landholder water rights have been satisfied.
4. On page 72 of the application the following statement is made, "Over the life of the model, evaporation and direct rainfall generally cancel one another out." Confirmation was also made on page 754 in correspondence that ***no allowance*** was made for evaporation in BRC inflow figures. Evaporation is obviously worst in hot conditions and during drought when there is no rainfall to cancel evaporation out. This false assumption effectively reduces average inflow calculations into the Winburndale Dam by up to 400ML per annum or around 1 ML per day!
5. The EA states "The proposed release conditions are modelled as resulting in no cease to flow events (compared to other modelled scenarios)." Photographic evidence, and numerous documented reports to the regulator prove that flows have ceased on many occasions over the last few decades at release rates higher that those proposed in this EA.
6. How can the approximately 600ML of annual water licences downstream be satisfied if the average release rate is proposed from the dam in the EA is 285ML?
7. The supply of water to the Winburndale System from tributaries can be meaningful in years of average rainfall but in drought conditions when these tributaries have dried up the only sustaining flow will come from the headwaters of the Winburndale rivulet which incidentally did not cease flowing during the most recent drought. These flows were significant and would have maintained the ecology of the rivulet if releases from the dam had not been limited to 0.88ML per day.
8. There are no proposed release protocols to amend extreme low flow rates in the rivulet in the event that the EA modelling is incorrect and 0.78ML per day is inadequate to sustain the riverine environment. Past experience at rates higher than the proposed 0.78ML per day would indicate that this will surely be the outcome.
9. Significant empirical data has been provided through the Winburndale Rivulet Platypus survey conducted by [redacted] and his expert opinion on environmental flow rates that would be required (based on actual experience setting flow rates in regional streams). This data and expertise has been ignored in the EA. A further critique by [redacted] of the newest version of the EA is at the end of these comments.

Under the proposed average release rate of 0.78ML per day, spills from the dam are calculated to augment flow and mimic natural flows. Obviously spill events will not occur when the dam is below the spillway and released flows are then the only method for flow variation. In 12 month period from mid Jan 2019 to 2020, (during the drought when the Winburndale Rivulet was under the most extreme stress) there were no spill events from the Winburndale Dam. There were, however, during this time many capture events in the dam from the upper catchment, none of which were passed through. Bathurst Regional Council release rates during this time remained under 1ML per day. This highlights the absolute necessity of the retention of DK3752-00001 or the emergency release provision. This clause should also not be hobbled with a yearly cap at 50ML as suggested in

the EA. If releases of inflow are needed in the view of the regulator they must be made in order for the water act to be complied with.

The discrepancies between factual, documented life experiences of landholders and the theoretical modelling (based on limited and incomplete data) contained in the report are so great that they are irreconcilable. The local knowledge from pre 1930 and the building of the dam was that the Winburndale Rivulet never went dry, even during the Federation drought which was comparable to the most recent drought ending 2020. This is not “empirical data” but is a well-accepted local fact. Why would the then Bathurst Council build its only water supply on a water source that might potentially stop flowing in a dry time? This rivulet was known to “never run dry”.

Bathurst regional Council have not acknowledged or addressed the environmental disaster and local platypus extinction event they created in the Winburndale Rivulet during the last drought other than to state “It is apparent from BRC release data that flows during 18-19 were below Council’s target of 20%. A fixed release will avoid this happening in the future.”
A fixed release that is too low will certainly ***not*** prevent this from happening.

No variations to the Bathurst Regional Council licence conditions can be contemplated until the most basic evaluation of the optimum environmental flow requirements of the Winburndale Rivulet and the basic water rights of downstream users has been established. The data and modelling in the EA has been tailored to achieve support for the untenable and false proposition that the flow rates suggested will support the environment of the Winburndale Rivulet and the needs of downstream users.

Critique of Premise's/Bathurst Regional Council Report, December 2021
[redacted], Principal Consultant Cenwest Environmental Services

1. The conclusions of my substantive report: *the Distribution, Abundance and Conservation Status of the Platypus and the Rakali in the Winburndale rivulet*, 23/3/2021, were:

   BRC has maintained a flow deficit in the rivulet for 16 years in breach of its licence condition, in spite of a number of warnings from the regulator. During droughts, flow releases averaging around 0.75 ML/day were unable to maintain a pool-riffle system within a 65 km rivulet in periods of low flow, more so under hot summer conditions when evaporation was optimal. Nor could downstream landholders access their riparian entitlements. Landholder observations over the 50-year assessment period (1970 -2020) have demonstrated the gradual decline of both the platypus and the Rakali from within the rivulet to possible local extinction or near extinction by early 2020. However, it cannot be discounted that small populations of both species still exist within the confines of the dam itself or upstream within the Winburndale Nature Reserve.

   Comment

   (1) My substantive recommendations on p18 have been ignored by Premise. I do note that Premise has made some attempt to better explain what data are included in their silo on which modelling is based. However, as landholders have pointed out the assumptions remain deeply flawed.
   (2) My critique of Premises 2020 report in Appendix 2 of the above report, appears to have been completely ignored. I stand by my criticisms in Premise's first and second iterations. My report is not even acknowledged in the Bibliography in the December 2021 Premise report. Surely the research and opinions of an independent and experienced consultant deserve consideration. I can only conclude that neither Premise nor BRC have adequate answers to the significant criticisms raised in that report.
   (3) My critique of the EMM report on Freshwater Ecology, (Appendix 3) remains unchanged and again no serious attempt has been made to address the issues raised by Cenwest, in spite of a subsequent aquatic ecology survey having been undertaken.

2. I am in full agreement with the current (January 2022) responses by the Winburndale Conservation Group, in their critique of Premise's December 2021 report.

   Further I would note:

   (1) Premise has failed to answer the critical question as to what constitutes a minimum flow rate that will maintain instream ecological integrity and riparian rights for landholders through to the rivulet's confluence with the Macquarie River.
   (2) What BRC is proposing remains non-compliant with the NSW Water Act.
   (3) To ignore evaporation rates from the dam under hot drought conditions in the modelling is completely unacceptable, when such losses from the Dam are substantial under such conditions.
   (4) Premise and BRC appear to place more reliance on 'spin' and wishful thinking rather than on actual scientific evidence.
   (5) Premise and BRC have continued to ignore determinations of environmental flows in other tablelands streams even though they were provided with such instances.

(6) Critical inflow measurements from two input streams into the dam remain seriously inadequate, given that such technology is readily available to measure such flows, particularly low flows. Furthermore, BRC has a full time ranger living on site who is able to monitor equipment.

(7) On p 20 the claim that the proposed release rules do not result in any significant impacts and meets the needs of the environment are breathtaking given the local extinction of the platypus colony and much more!

(8) No where does Premise assess how their proposed release of 0.7 ML/day would service environmental and riparian needs along a 65km stream under drought conditions.

(9) The significant pipeline leakages of up to 3ML/day are not addressed nor included in the modelling.

(10) There remains widespread concern about the upkeep of the daily logbooks.

(11) The summary of the aquatic Ecology impacts, pp109-110 make no references to Cenwest's submission and criticism, nor the fact that the local platypus population, likely became extinct due to inadequate flow releases under hot summer conditions.

(12) The references provided on pp 116-117 do not include the substantial inputs to the process by independent consultants nor other interested parties!

(13) Appendix D, Ecological Assessment

- The unchanged (?) EMM report does not respond to the criticisms made by Cenwest (2021).
- Does not cite Cenwest's report in the references on pp 216-219 or any other inputs from third parties.
- There is no evidence that they have even read such third party reports.
- Ignores the fact that the release protocols likely caused the extinction of the local platypus population!
- Does not address what constitutes an adequate environmental release in the Winburndale Rivulet.

(14) Appendix E is a supplementary report prepared by EMM, December 2021.

- The points raised in (13) above apply. Nothing to see here is the ongoing attitude and nor is there questioning of the modelling, provided by Premise.
- Again EMM have either ignored Cenwest's 2021 findings or perhaps not bothered to read this paper.
- Appendix E: Depth rating on pp 367-371
  No attempt is made to indicate how this report adds to our understanding of the ecology of the Winburndale Rivulet and no reasons are provided as to whether or not this is another example of hopeful modelling.

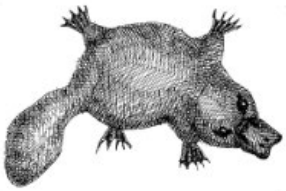
(15) Appendix F, Secure Yield and Hydrological Analysis

- Section 5 p 418 – am I right in concluding that allowances for climate change have not been included in the modelling. That would be a disastrous outcome given the predictions are that stream flows in the Central West are likely to reduce by up to 30% .
- There are serious questions as to the reliability of Premise's modelling, particularly under low flow scenarios when dam evaporation is not taken into account nor the considerable leakages from the Winburndale pipeline.
- The modelling simply does not ring true with the lived experiences of downstream farmers.

- The recommendation that pluviometers should be installed to better determine catchment rainfall is long overdue, not to mention installation of appropriate flow meters that were a licence requirement.
- There is no modelling of flows in the many tributaries of the Winburndale Rivulet.

(16) Appendix L: Communications log

- Parts of Cenwest's extensive report is recorded on pp 770-772, appearing in full on pp 858-904. However, Cenwest's concerns are neither acknowledged nor addressed . Why not?
- Many concerns are raised in the many submissions by interested parties but few of these concerns are adequately addressed in the Premise December 2021 report, and many are completely ignored.



Winburndale Waters Conservation Group

A collective of concerned locals who live along the Winburndale Rivulet and want to see it thrive

The following comments are provided by the Winburndale Waters Conservation Group (WWCG) in response to the proposal to amend environmental flow rules associated with the Winburndale Dam. This group represents the interests of concerned locals most of whom reside on or own land along the Winburndale Rivulet. Many individuals have received the notification letter from Premise Australia outlining the purpose of the application. WWCG is however concerned at the large number of landholders who received no notification of the proposal potentially removing their right to consultation. It is understood that Bathurst Regional Council was responsible for providing contact details to Premise Australia.

This submission will directly respond to matters raised in the Premise letter to landholders**.**

1. Flow rules

The statement "The current Licence for the Winburndale Dam provides for water to be released from the dam into the Winburndale Rivulet, under differing flow rules under different conditions ("the flow rules") is not correct. The flow rule in Bathurst Regional Council's conditions of operation has been modelled on the transparent flow model meaning all flows into the dam should be passed through to the rivulet below up to the limit of the designated pipe (300mm). The flow rules are very clear. (See appendix A).

The only variable flow condition was a new and additional condition for a particular and uncommon set of circumstances. This condition was introduced in 2004 after an agreement was reached between the then Bathurst Mayor Norm Mann, [redacted] and the Winburndale Water Users Group. This new condition was brokered by Fred Hundy of the Department of Infrastructure, Planning and Natural Resources after Bathurst Council had been found to be again in breach of their licence conditions and undercompensating the Winburndale Rivulet during a time of severe water stress (see appendix B).

2. Suggested seasonal discharge rates

The suggested seasonal discharge rates contained in the proposal are fixed and bear no relationship to the prevailing seasonal conditions. One size does not fit all!
The summer rate suggested of 0.65ML per day will not support the environment of the Winburndale Rivulet in any average summer. The Rivulet was stress tested in the last drought and during calendar 2019 release rates of 0.7ML per day killed the stream below the dam and deprived landholders of their basic stock and domestic water rights. This was at a time when inflows were on average 3ML per day.

An Average flow rate of 0.78ML (as claimed by council to be the average release figure over 40 years) per day equates to an annual release into the rivulet of 284.7ML. This equates roughly to only the equivalent of the amount of evaporation experienced by the dam (see table 1). This figure is also included in calculations of inflow and should be discharged as part of the release required in condition **DK3944-00001**. For these figures to be claimed as historic and in place for decades would mean that no inflow into the dam was ever discharged other than the allowance for evaporation? OR to be compliant with condition **DK3944-00001** that there was no inflow at all for 40years? This is plainly impossible as Bathurst Regional Council have extracted their 1000ML per annum or near to this amount each year. In addition some 600ML of annual irrigation entitlements are somehow meant to be accommodated. This is impossible if release rates are 284.7ML.

The proposed release rates also come with the caveat that "Discharge at the relevant seasonal discharge rate shall occur except where the dam is full and spilling – when the volume of flow will be greater". What if this spill event occurs during a drought when there is no flow to the confluence of the Macquarie River? Again these seasonal discharge rates are not relevant to the requirements of the rivulet under different seasonal extremes.

The proposed seasonal discharge rates are well outside the Bathurst Regional Council operating conditions of the Winburndale Dam and will cause damage to the environment and remove basic individual water rights. The discharge figures mentioned provide proof of historic and continuous breaches by Bathurst Regional Council of their licence conditions and cannot be used to justify a change to accommodate these very breaches as part of the proposed new licence conditions.

3. Environmental Assessment

It seems obvious that an environmental assessment to compare the historic releases made by Bathurst Regional Council (in breach of their conditions) with rates that are almost identical will show an equal deficit in environmental flow down the Winburndale Rivulet or "business as usual".

A true environmental assessment would look at the state of the Winburndale Rivulet after years of these inadequate releases. The Winburndale Waters Conservation Group have engaged [redacted] as a consultant working on a pro bono basis with no vested interests other than the health of the rivulet and the pleasure of working with a committed group of farmers. [redacted] comments on the minimum requirements for an environmental assessment determining environmental and riparian release rates for the Winburndale Rivulet are copied below.

Some comments on riparian and environmental flows in the Winburndale Rivulet

1. **To adequately determine the required environmental and riparian flows from the Winburndale Dam, under the control of Bathurst Regional Council, the following would need to be in place and/or considered.**

1) **Flow inputs into the dam particularly via the Gulfstream and the upper Winburndale Rivulet must be robustly measured in such a manner that a flow rate can be converted into a volume flow (ML/day). Ideally these should be telemetry based systems so that flow in real-time can be accessed by landholders as well as BRC.**
2) **The development of flow duration curves for the Rivulet above the weir, the percentage of times that flows are recorded from low to high, a catchment water model based on reliable 100-year rainfall data preferably from the Yetholme area.**
3) **The development of a water balance model which should take into account, flow inputs, loss of water via evaporation under a range of conditions and dam volumes, water leakage, and expected flow releases (BRC, downstream landholders – irrigation rights, riparian and environmental flows), average annual streamflow above the weir, average volume harvested per year, proportion of streamflow harvested.**
4) **A well-argued public document describing transparent water release strategy/methodology, that meets the requirements of the water sharing plan upstream of the Burrendong Dam, including the need for riparian and environmental flows. These flows need to be of sufficient volume to enable the length of the Winburndale Rivulet from the dam through to the junction with the Macquarie River to be serviced, to ensure that all landholders receive their fair share of water releases as well as meet environmental needs.**
5) **It should be possible to determined parameters such as dam leakage and the rate of extraneous flows into the dam from non-streamflow sources, et cetera.**
6) **The method used to determine environmental flows and riparian releases and associated rules need to be based on well understood scientific methods, and not determined on ad hoc historical releases that may have previously been determined by BRC, unless it can be demonstrated that such releases were determined using an appropriate science-based methodology. Ideally such releases should be operated telemetrically.**
7) **The water sent to Bathurst via the existing pipeline and downstream of the weir need to be measured with a tolerance of +/- 10%. It should be possible to determine what leakages occur from the existing pipeline.**
8) **The percentage of pipeline flow destinations need to be determined on at least a monthly basis as, water for sporting irrigation purposes would have a lower priority than water destined for human uses. This needs to be transparent.**
9) **It should be possible to experiment with water releases into the Rivulet under a range of conditions, to optimise flow release regimes.**
10) **There are limited irrigation rights available to specific landholders and these needed to be honoured when required and considered in the flow determinations. Presumably these would be made on an 'as needed' basis**
11) **Any flow release strategies and associated rules, need to make perfectly clear the priorities of water releases in regards to riparian flows, environmental flows, irrigation flows, and water releases to service Bathurst City (irrigation and human consumption), and the basis for such prioritisation.**

2. **As a professional consultant and ecologist I determined the environmental flows required below the Cadiangullong Weir (4200 ML) in the Lachlan Catchment for Cadia Mines and also below the pipe-head Duckmaloi Weir (20ML) in the upper Macquarie catchment for**

the Fish River System. In the last decade these releases have been modified but I am not aware of the outcomes. Based on that experience I would expect that under normal circumstances, combined riparian and environmental releases down the Winburndale Rivulet would likely be between 2-4 Ml/day. However, whatever the flow rate that is eventually determined, it should be possible to determine experimentally, whether such flows transmit throughout the length of the Rivulet.

3. **Earlier this year I helped design a pro forma to determine with landholders the presence/absence of platypuses and native water rats along the Winburndale Rivulet. A preliminary assessment of the data which is currently being analysed, suggests that platypuses disappeared completely from the Rivulet downstream of the dam and that the native water rat is likely locally extinct. In my opinion the loss of platypuses, which since the break of drought appear to have re-invaded the rivulet in very low numbers from the Macquarie River, was likely directly attributable to the failure of BRC to release riparian and environmental flows down the Rivulet as required under existing water sharing arrangements. This caused important larger refuge pools to dry out. Under such extreme drought conditions platypuses will attempt to move downstream, are unlikely to have bred, and probably suffered very high mortality rates. It is likely that in the near future that the platypus will be determined under state and federal law to be an endangered species. If and when this occurs this may come with additional water demands. This possibility should be kept in mind.**

4. The environment of the Winburndale Rivulet under the stewardship of Bathurst Regional Council.

It has been regularly commented on that the Winburndale Rivulet has not been the same in the last couple of decades. Flow rates particularly in summer have been reduced beyond those of previous decades. The Winburndale Rivulet was once thriving with platypus, native water rats, freshwater marron, water dragons and numerous native fish. Other wildlife and the ecology of the Winburndale Valley all rely on the Winburndale Rivulet for water.

A steady decline in these populations has been evident over the last two or three decades. Land management and environmental awareness has been improving significantly during this time with significant environmental projects targeting riverine health occurring all along the Winburndale Rivulet. Most recently a massive almost extinction like event occurred during the drought of 2018/19/20. Firstly flow stopped and water holes receded then water holes that have never been dry in living or passed down history dried up. At this time a landholder was told after enquiring to Bathurst Regional Council that the valve at the dam was actually shut off completely as there was “no visible flow” above the dam.

The woes of the Winburndale Rivulet are exclusively due to the flow management of Bathurst Regional Council. Historic discharge rates mentioned by council reinforce the suspicion that water was being constantly held back in the dam for later diversion to Bathurst in breach of the operating conditions and unnecessarily so. When rain began to fall in early 2020 the Winburndale Dam was still at 70% capacity (about 1200ML). A mere fraction of this amount of water would have alleviated the record dry event in the Winburndale Valley but despite requests both Council and the NRAR would not make even a token release despite inflow being obviously present when dam level figures were calculated. Many of the last platypus breeding holes dried out during this event.

Photo 1- unprecedented dry creek bed and water holes in Winburndale Rivulet at a time when the valve was completely shut off by Bathurst Regional Council. Jan 2020


Photo 2- waterhole never previously seen dry. Jan 2020

5. Conclusion

The Winburndale Rivulet and the Winburndale Dam are part of a water sharing plan and subject to conditions and regulations.
Environmental flow has priority over other water uses in normal times and this must be respected.
Landholders stock and Domestic rights are critical to their ability to live and operate businesses in the Winburndale Valley. These rights must be respected.

The proposed fixed seasonal discharge rates have been shown to be inadequate, are outside the operating conditions of the Winburndale Dam and will not allow for the certainty of any of these water rights.

The Winburndale Rivulet is a finite resource and does not exist for the sole purpose of satisfying the growing city of Bathurst with its water requirements which have been used solely up to date for non-potable purposes such as watering sporting fields and parks and gardens. Integral to the value of properties on the Winburndale Rivulet is the fact that they have security of safe high quality water. The proposed seasonal discharge rates would erode and possibly remove this certainty of quantity and also quality. Low flows reduce water quality, sometimes making it unfit for livestock.

With specific reference to the purpose of the application to amend the licence conditions.
To “clarify the flow rules”. - The flow rules are very clear and have been pointed out to council on many occasions.
To “align the daily discharge to natural seasonal variations”. – the suggested rates do not accommodate the environment, any other water users rights or prevailing seasonal extremes.

It is wrong for council to propose changes to conditions of operation that make a mockery of the water sharing plan and the rights of all interests below the dam. The proposed release conditions were exactly the releases that have resulted in many cautions to council for non-compliance most recently by the NRAR this year. The proposed seasonal discharge

rates would perpetuate the injustice that has been documented and proven through investigation by the NRAR and previous regulators.

If Bathurst Regional Council were to show genuine interest in the rights of all involved as should be their charter there might be room for compromise.
A compromise condition could be added to allow Bathurst Regional Council to retain more water in the dam at times of high flow where flow is reaching the Macquarie River. This could be achieved by capping the discharge rate at a level to be arrived at through experimentation (i.e. a discharge rate that maintains flow and waterhole levels) and proper professional hydrological studies and consultation. Individuals and the representative bodies (Winburndale Water Users Group and the Winburndale Waters Conservation Group) should be part of this discussion and decision making process.

[redacted]

Appendix A

The primary and only continuous flow condition

The following condition controlling water releases is very specific and has been in place for decades in the licence conditions for Bathurst Regional Council to operate the Winburndale Dam.

DK3944-00001 The 300mm valve must be operated to maintain a flow in the
watercourse downstream of the dam. The flow must be equal to the flow entering the storage of the dam or the capacity of the 300mm pipe, whichever is the lesser discharge

This same condition was listed as condition 3 of the original licence.

80SL004674

Department of Infrastructure, Planning and Natural Resources

CONDITIONS STATEMENT REFERRED TO ON
80SL004674
RENEWED UNDER PART II OF THE WATER ACT, 1912
ON 20-Dec-1993

(2) A PIPE WITH A DIAMETER OF NOT LESS THAN 300 MILLIMETRES, FITTED WITH A STOP VALVE OR OTHER CONTROL DEVICE SHALL BE CONSTRUCTED THROUGH THE DAM OR A 300 MILLIMETRE VALVE INSTALLED AND MAINTAINED IMMEDIATELY DOWNSTREAM OF THE DAM IN THE GRAVITATION MAIN TO THE SATISFACTION OF THE DEPARTMENT OF INFRASTRUCTURE, PLANNING AND NATURAL RESOURCES.

(3) WHEN A FLOW IS ENTERING THE STORAGE OF THE DAM THE VALVE REFERRED TO IN CONDITION (2), SHALL BE SO OPERATED AS TO MAINTAIN A FLOW IN THE WATERCOURSE DOWNSTREAM OF THE SAID DAM EQUIVALENT TO THE FLOW ENTERING THE STORAGE OF THE DAM FOR THE TIME BEING OR THE CAPACITY OF THE SAID PIPE, WHICHEVER IS THE LESSER.

This allows for the transparent flow model with a limit which was dictated by the capacity of the 300mm pipe.

Bathurst Regional Council are well aware of their main licence obligation to release all inflows into the rivulet below and have been reminded of this obligation several times over the last 3 decades including by the then licensors including the Department of Water Resources, Department of Infrastructure, Planning and Natural Resources, NSW Water and Crown Land and Water.

Appendix B

Emergency drought provision release condition (introduced 2004)

DK3752-00001 A. When the water level in the dam, authorised by this approval, is below its crest level, flows entering the storage must be released through the 300 mm valve to ensure the release of:
i. 20 % of the increment of the storage conserved in the preceding flow event, or,
ii. 50 % of the increment of the storage conserved in the preceding flow event when a drought declaration has been made by the NSW Government, or
iii. 80 % of the increment of the storage conserved in the preceding flow event when exceptional circumstances have been announced by the Commonwealth Government in response to prolonged drought.
B. Water must be released from the dam only:
i. on request from the relevant licensor, and
ii. when inflows have been recorded for not more than 28 days before the request.

This was listed as condition 4 of the licence at the time.

(4) IN THE EVENT OF FLOWS ENTERING THE STORAGE WHEN WATER LEVELS IN THE DAM ARE BELOW CREST LEVEL, THE LICENSEE MUST RELEASE A FLOW THROUGH THE VALVE REFERRED TO IN CONDITION (2) THAT WILL RELEASE:

(A) 20% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT OR;
(B) 50% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT WHEN A DROUGHT DECLARATION HAS BEEN MADE BY THE NSW GOVERNMENT OR;
(C) 80% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT WHEN EXCEPTIONAL CIRCUMSTANCES FUNDING HAS BEEN ANNOUNCED BY THE COMMONWEALTH GOVERNMENT IN RESPONSE TO PROLONGED DROUGHT.

THESE FLOWS ARE ONLY REQUIRED TO BE RELEASED UPON REQUEST FROM THE DEPARTMENT OF INFRASTRUCTURE PLANNING AND NATURAL RESOURCES WHEN INFLOWS HAVE BEEN RECORDED NOT MORE THEN 28 DAYS BEFORE THE REQUEST.

This new condition was designed in order that an event of a sudden and short storm during a drought that increased the level of the dam but did not cause water overtop the spillway. This event would not provide continuous “flow” that could be compensated by condition **DK3944-00001** (condition 3). In a time of water stress this condition allowed for the relevant licensor to instruct Bathurst Regional council to release an according amount (I , (ii or (iii depending on the seriousness of the drought. This request from the licensor must also be within 28 days of the inflow event.

This new condition **DK3752-00001** (condition 4) was only ever an additional release on top of condition **DK3944-00001** (condition 3) and never a standing instruction. I believe it was only ever enacted twice and due to the changes in licensor from Dept. Water resources to Crown Water to NSW Water etc there was never any retained corporate knowledge and it was extremely hard to communicate the request to the new regulator.

There were in fact no less than three attempts to invoke this condition during the drought of 18/19/20 during which time the new licensor the NRAR would not make the request. This was despite the Rivulet being decimated through lack of flow and Bathurst Regional Council being in clear breach of their licence conditions regarding flow releases (resulting in a caution from the NRAR).

Please find attached a copy of licence conditions from Nov 25 2004 (see APPENDIX C) with a covering letter [redacted] specifically introducing the "new conditions" (condition 3) and referring to the difficulties experienced in getting Bathurst Council to comply with basic water requirements of the licence. An excerpt is copied below.

[redacted]

Please find enclosed a copy of the licence conditions now attached to the licence held by Bathurst Regional Council for Winburndale Rivulet Dam. They are the same as the statement sent to you previously for comment.

I wish to thank you for your cooperation and patience in resolving this matter. With the new conditions in place the dam will be operated in a way that will hopefully provide for more appropriate releases for downstream users and instream requirements.

Also please find attached a copy of the covering letter to the same licence conditions from Nov 25 2004 to the General Manager of Bathurst Regional Council (see APPENDIX D) specifically thanking [redacted] for his help with drafting the new conditions. Reference is made to having transparency in the operation of the dam which had been lacking. The lack of transparency issue has continued to this day with council not making available relevant data to ensure that compliance was being maintained. This has led to obvious water shortages in flow downstream, complaints and investigations and an official caution by the NRAR proving council were not compliant with their licence conditions.

There was never a condition of similar nature prior to 2004 and it is erroneous to suggest that Bathurst Regional Council have operated under any form of variable flow model other than maintaining the discharge from the dam at an equivalent rate to that rate of inflow.

Appendix C

Department of
Infrastructure, Planning and Natural Resources

[redacted]

Dear [redacted]

Please find enclosed a copy of the licence conditions now attached to the licence held by Bathurst Regional Council for Winburndale Rivulet Dam. They are the same as the statement sent to you previously for comment.

I wish to thank you for your cooperation and patience in resolving this matter. With the new conditions in place the dam will be operated in a way that will hopefully provide for more appropriate releases for downstream users and instream requirements.

If you have any questions or comments I can be contacted at the Dubbo office on 68417406.

[redacted]

Department of Infrastructure, Planning and Natural Resources

CONDITIONS STATEMENT REFERRED TO ON 80SL004674 RENEWED UNDER PART II OF THE WATER ACT, 1912 ON 20-Dec-1993

(1) THE LEVEL OF THE CREST OF THE DAM SHALL BE FIXED AT REDUCED LEVEL 796.75 METRES (STANDARD DATUM).

(2) A PIPE WITH A DIAMETER OF NOT LESS THAN 300 MILLIMETRES, FITTED WITH A STOP VALVE OR OTHER CONTROL DEVICE SHALL BE CONSTRUCTED THROUGH THE DAM OR A 300 MILLIMETRE VALVE INSTALLED AND MAINTAINED IMMEDIATELY DOWNSTREAM OF THE DAM IN THE GRAVITATION MAIN TO THE SATISFACTION OF THE DEPARTMENT OF INFRASTRUCTURE, PLANNING AND NATURAL RESOURCES.

(3) WHEN A FLOW IS ENTERING THE STORAGE OF THE DAM THE VALVE REFERRED TO IN CONDITION (2), SHALL BE SO OPERATED AS TO MAINTAIN A FLOW IN THE WATERCOURSE DOWNSTREAM OF THE SAID DAM EQUIVALENT TO THE FLOW ENTERING THE STORAGE OF THE DAM FOR THE TIME BEING OR THE CAPACITY OF THE SAID PIPE, WHICHEVER IS THE LESSER.

(4) IN THE EVENT OF FLOWS ENTERING THE STORAGE WHEN WATER LEVELS IN THE DAM ARE BELOW CREST LEVEL, THE LICENSEE MUST RELEASE A FLOW THROUGH THE VALVE REFERRED TO IN CONDITION (2) THAT WILL RELEASE:

(A) 20% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT OR;
(B) 50% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT WHEN A DROUGHT DECLARATION HAS BEEN MADE BY THE NSW GOVERNMENT OR;
(C) 80% OF THE INCREMENT OF STORAGE CONSERVED IN THE PRECEDING FLOW EVENT WHEN EXCEPTIONAL CIRCUMSTANCES FUNDING HAS BEEN ANNOUNCED BY THE COMMONWEALTH GOVERNMENT IN RESPONSE TO PROLONGED DROUGHT.

THESE FLOWS ARE ONLY REQUIRED TO BE RELEASED UPON REQUEST FROM THE DEPARTMENT OF INFRASTRUCTURE PLANNING AND NATURAL RESOURCES WHEN INFLOWS HAVE BEEN RECORDED NOT MORE THEN 28 DAYS BEFORE THE REQUEST.

(5) WHEN THE VALVE REFERRED TO IN CONDITION (2) IS OPERATED IN ACCORDANCE WITH CONDITION (4) THE LICENSEE MAY CLOSE THE VALVE WHEN FLOWS IN WINBURNDALE RIVULET HAVE REACHED THE CONFLUENCE WITH THE MACQUARIE RIVER.

(6) IF AND WHEN CALLED UPON BY THE DEPARTMENT OF INFRASTRUCTURE PLANNING AND NATURAL RESOURCES TO DO SO THE LICENSEE SHALL INSTALL IN THE STORAGE OF THE DAM AN AUTOMATIC WATER LEVEL GAUGE AND SHALL IF CALLED UPON TO DO SO FORWARD CHARTS FROM THE SAID REGULATOR AT SUCH INTERVALS AS MAY BE REQUIRED BY THE DEPARTMENT.

(7) THE LICENSEE SHALL RECORD ON A DAILY BASIS RELEASES OF WATER FROM THE DAM INTO WINBURNDALE RIVULET THROUGH THE VALVE REFERRED TO IN CONDITION (2), RELEASES INTO THE DIVERSION PIPE, AND STORAGE LEVELS.

(8) THE LICENSEE SHALL SUPPLY THE RECORDS REFERRED TO IN CONDITION (7) TO THE DEPARTMENTS DUBBO OFFICE ON A YEARLY BASIS IN A FORM AND MANNER APPROVED BY THE DEPARTMENT.

(9) NOTWITHSTANDING CONDITION (8) THE LICENSEE SHALL, UPON REQUEST BY THE DEPARTMENT TO DO SO, SUPPLY THE RECORDS REFERRED TO IN CONDITION (7).

80SL004674

THE WORK SHALL BE CONSTRUCTED AND MAINTAINED IN A SAFE AND PROPER MANNER THAT MINIMISE THE POSSIBILITY OF DAMAGE BEING OCCASIONED BY IT, OR RESULTING FROM IT TO UBLIC OR PRIVATE INTEREST.

End Of Conditions

Note: You are advised that the right to take and use water granted by this entitlement may be varied once the ments' Murray Darling Basin Water Management and River Flow Objectives Policy has been finalised

Appendix D

WINBURNDALE LICENCE

23

Department of
Infrastructure, Planning and Natural Resources

BATHURST COUNCIL
2 5 NOV 2004
REF 32.0001/2/023

[redacted]

General Manager
Bathurst Regional Council
PMB 17
Bathurst NSW 2795

2 5 NOV 2004

Dear Sir/Madam,

Please find enclosed the amended conditions attaching to the licence for Winburndale Rivulet Dam. I would like to thank you, and in particular [redacted] for your assistance and cooperation in resolving this matter.

Please note in particular Conditions (4), (7), and (8) which require release, measurement and reporting of flows and storage levels. These are new conditions which will help to provide a level of transparency to the way the dam is operated and address some of the concerns of downstream landholders.

If you have any questions about the operation of any of the conditions I can be contacted direct at the Dubbo office on 68417406.

[redacted]

Evaporation

Surface area of the Winburndale Dam **18 Ha**

180000 square metres

2019

Evaporation statistics Bureau of Metorology - Bathurst Airport

	Evapotrans-piration (mm) 0000- 2400			Evap rate	Water loss	
	mm	m		m3	L	ML
Jan	201.7	0.2017		36306	36306000	36.3
Feb	158.6	0.1586		28548	28548000	28.5
Mar	118.9	0.1189		21402	21402000	21.4
Apr	90.3	0.0903		16254	16254000	16.3
May	52	0.052		9360	9360000	9.4
June	36.9	0.0369		6642	6642000	6.6
Jul	49.1	0.0491		8838	8838000	8.8
Aug	68	0.068		12240	12240000	12.2
Sept	105	0.105		18900	18900000	18.9
Oct	153.3	0.1533		27594	27594000	27.6
Nov	199	0.199		35820	35820000	35.8
Dec	197.3	0.1973		35514	35514000	35.5
2019	1430.1	1.4301	0	257418	257418000	257.4

Table 1

2019 Annual evaporatrion loss from Winburndale Dam

Per annum	257.4	ML
Per Day	0.71	ML

Table 1

Winburndale Dam Licence Amendment Application Environmental Assessment - further consultation

Please accept this submission [redacted]

[redacted] have farmed on [redacted] for over ninety years and have watched the steady deterioration of the Winburndale Rivulet with dismay. The last drought (2017-2020) was the most severe in impact and saw all flows stop in the Winburndale Rivulet. As a result many water holes dried up completely for the first time in living memory or the passed down history from before the dam was built. We have recorded sightings of platypus and rakali in breeding holes on our farm. These were all wiped out over the last decade through the low flow release regime of Bathurst Regional Council

In the Winburndale Rivulet Aquatic Ecology Assessment Prepared for Premise Australia Pty Ltd by EMM Consulting Newcastle, the Executive Summary states that "The proposed water supply works approval amendment seeks to provide certainty in terms of the requirements for sustaining environmental flow". This comment aligns well with the comments of the General Manager of Bathurst Regional Council Mr David Shirley who was quoted in the Western Advocate on March 2 2021 as having said "council is continuing to work with NRAR in relation to Winburndale Environmental Release Conditions, ensuring the security of the town water supply, in addition to achieving optimum environmental outcomes". In light of these comments it is extremely disappointing that this ecology assessment does not address the fundamental issue at hand which is - What is the required environmental flow to maintain the health of the Winburndale Rivulet?

The proposed release rate of 0.78ML per day average is in fact lower than the 16 year average provided by Bathurst Regional Council in their Winburndale Dam Last 16 yrs Data. Average daily environmental flows into the Winburndale Rivulet were over 1.25ML per day but as the drought progressed environmental flows were reduced to 0.88ML per day average for 2017,2018,2019.
The negative effects on the Winburndale Rivulet were a result of these low flow rates averaging 0.88ML per day

The EMM assessment makes the below assumption regarding a 0.78ML per day average release (0.65ML per day in summer).
If reduced water release occurs during dry summer months when water temperature is higher and nutrients are concentrated, then blooms of potentially toxic algae may occur.

However, field data indicates that a sufficient concentration of bloom-forming algae is unlikely to occur within the Winburndale Rivulet.

The following 2 photos were taken [redacted] during the drought of 2017, 2018 and 2019 and they categorically refute any such assumption.

Algal blooms are common with the historic environmental flow rates released by Bathurst Regional Council. This was the common condition of the Winburndale Rivulet during the 2017, 2018 and 2019 drought years with an average flow rate of 0.88ML per day

The EMM assessment also makes the assumption under an environmental flow rate of 0.78ML per day that- The primary direct impact with the potential to occur is that there may be a minor decrease in annual water volume and subsequent flow along the along the Winburndale Rivulet and into the Macquarie River as a result of the proposed water supply works approval amendment. However, the Council intends to utilise the full allocated licence limit of 1,000 ML/year, with any impacts limited to seasonal variation (indirect impact).

Again the following photos are absolute proof that an environmental flow rate of 0.88ML per Day was nowhere near adequate to maintain flow in the Winburndale Rivulet during the drought of 2017, 2018,2019. The suggested summer release rate of 0.65ML per day in summer is about 40% less than the rate that produced this dried out and decimated Winburndale Rivulet.

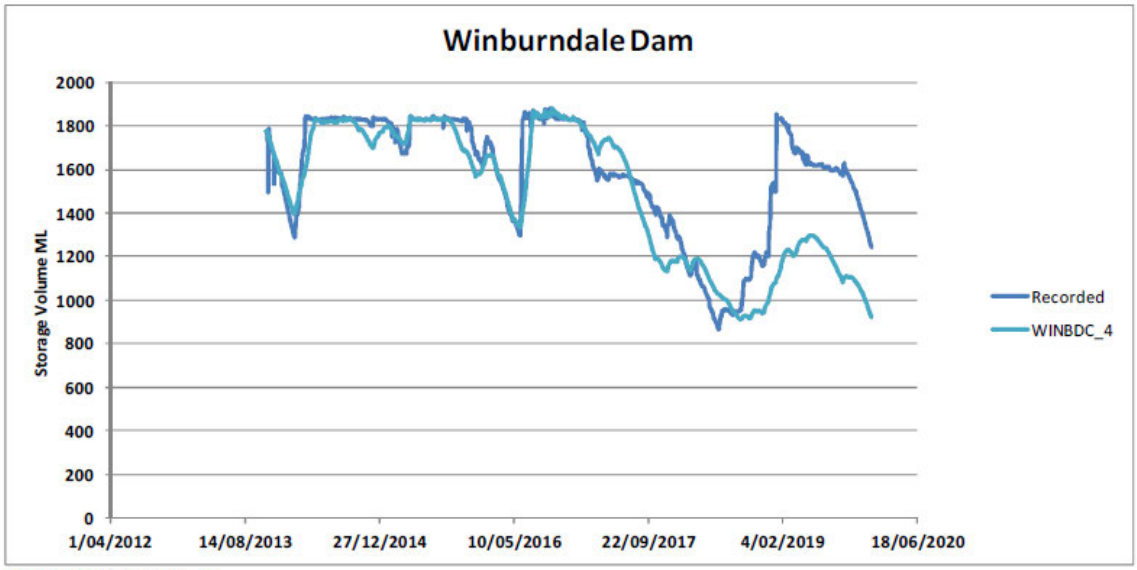
These water holes have never previously dried out in living memory. [redacted] has relayed the recollection his father and his discussions with the “old timers” in this locality. They all said the Winburndale would never stop flowing in a drought.

The hydrological study and the secured yield analysis are also of concern as they seek to place their entire focus on the needs of Bathurst and do not model or quantify the water rights of the environment, landholders or water licence holders. A case in point is the comparison of flows below where the model actually predicts significantly lower flows than the factual recorded data especially in drier times (NB 40% lower modelled dam levels than actuals).

The comment associated with the comparison is also worrying as the modelled figures were used as they were more conservative. This underestimates the inflow which then requires reduced environmental flows to “gain” the targeted secure yield. This is to the detriment of environmental flows. The benefit of the doubt should have gone towards the environmental flows as they are higher in priority and have historically been subject to lower release rates than the conditions stipulate.

Figure 2 compares the recorded storage behaviour with that from
using the modelled inflows. The modeled inflows were considered appropriate for estimating secure yield and were preferred as were conservative compared to the other series developed.

Figure 2: Storage Level Comparison for Series 4 Flows



Series 4: WINBDC_4

The reason for the modelling being wrong is the location of the coordinates for the rainfall data generation. The two coordinates for the 1890-2019 modelled rainfall data are in the bottom of the catchment within 3km of the wall of the dam. One is actually downstream of the dam and therefore not even in the catchment. The other coordinate referred to in the hydrology study is on the crest of a major mountain and almost certainly part of the Bathurst basin rain shadow. The upper catchment of the dam has much higher rainfall than the lower catchment near the dam wall. Using actual data from weather stations in the upper catchment for the same years as modelled data shows a consistently higher rainfall than that modelled from the lower catchment coordinates. The actual station figures range from 5% to 9% higher with the average discrepancy 7% higher than the modelled data. On an inflow of 4GL per annum this could easily equate to another 300ML of inflow which should be firstly allocated to environmental flow and landholder water rights then to assist with secured yield. If rainfall was modelled in the upper catchment it could be higher again as there is a limitation to the data available at some stations.

By selecting the "conservative" inflow estimates and under estimating the rainfall in modelling, then offering a fixed average release, the application is effectively "gaming" the process as any increases to those modelled become additions to the volume stored in the dam.

The water priorities are clearly shown in Table 3 below.
The Water Access Licence for the Winburndale Dam clearly sits below the rights of the environment and the basic landholder rights in all normal circumstances which is when the WAL would operate. The first priority must be given to a suitably calculated and modelled

environmental flow and basic landholder rights and thereafter flows can be allocated to the secure water needs of Bathurst Regional Council.

Table 3. Priorities for water sharing

Priority	Extreme events	Normal circumstances
Highest	• Critical human water needs	• Needs of the environment
High	• Needs of the environment	• Basic landholder rights
	• Stock • High security licences • Commercial and industrial activities authorised by local water utility • Water for electricity generation on a major utility licence • Conveyance in supplying water for any priority 3 take	• Local water utility access licences • Major utility access licences • Stock and domestic access licences
	• General security licences	• Regulated river (high security) access licences
Low	• Supplementary licences	• All other forms of access licences • Supplementary access licences

Source: Based on priorities table in *Macquarie-Castlereagh Surface Water Resource Plan: Schedule G—Macquarie-Castlereagh Incident Response Guide*

The existence of the Winburndale Dam with its historical operational regime can only be described as an environmental disaster and a continuous source of uncertainty for landholders downstream with regards to their water security. Under current management and historic breaches of licence conditions the existence of the dam has prevented natural water flows and this infrastructure also leads to the loss of over 500ML of evaporation annually from the Winburndale Rivulet water system. In order for Bathurst Regional Council to try and secure 1000ML per annum of water they lose 500ML from the system and offer only 285 to the rivulet below.

The basis for the Winburndale Dam Licence Amendment Application Environmental Assessment is so flawed that it should really be considered a new licence application. The suggested 0.78ML average release rate is totally inadequate in light of the cessation of flow that has occurred with an average release rate of 0.88ML per day in the drought. This figure has not been derived scientifically and the EA has not ascertained what the environmental flow requirements are for the Winburndale Rivulet.

All assumptions in the Desktop EMM report are based on guesses and ignore hard facts that occurred during the drought. The hydrology report utilises compromised modelling on

rainfall data due to the coordinates for the modelling being in the lower rainfall, lower catchment.

The potential removal of condition DK3752-00001 or the emergency release provision would remove the last safeguard for potential releases downstream when there are significant inflows in the catchment but the water level is below the spillway. This condition has been used previously. When it was used it was absolutely critical. If it had been enacted as requested three times in the last drought it would likely have saved many of the last platypus breeding holes.

It is in the interests of everyone involved that this licencing matter be handled in a way that reflects the true spirit of the water sharing plan and NSW water regulations. The environment must receive adequate water and with due regard to natural flow regimes. Landholders along the Winburndale Rivulet have farmed from before the time of the dam. These farms deserve the security of water that is part of their basic landholder rights as well as stock and domestic supplies. Bathurst Regional Council has built and must maintain the Winburndale Dam. It must also abide by the conditions that control its use of this infrastructure.

The cost benefit of the Dam, its operating costs, upgrades and cost of associated pipelines and facilities are councils business. They cannot be used as an argument to extract more water from the environment or landholders share. This is a tiny dam with limited inflow. It will not be the panacea for a growing Bathurst's Water security into the future. It will however be the source of extreme negative publicity in the future if the environment of the Winburndale Rivulet is taken for granted and council ignore their legal and moral obligations.

Bathurst Regional Council should, as the General Manager suggests, be "achieving optimum environmental outcomes". To achieve the most desirable or best outcome for the environment there is no alternative, there must be a qualified assessment of the "optimum" environmental flow for the Winburndale Rivulet.

The Distribution, Abundance and Conservation Status of the Platypus and the Rakali (Water-rat) in the Winburndale Rivulet

23rd April 2021

Prepared on behalf of the Winburndale Waters Conservation Group.

This report also includes:

Appendix 1: information provided by the Bland family on platypus and water rats in the Yetholme - Sunny Corner area

Appendix 2: A critique of the following report:

Premise (2021) *Environmental Assessment – Winburndale Dam Water Supply Works Approval – Amendment for Clarification of Conditions:* Report No: 221135/EA, Rev:001E, 15th January 2021, prepared on behalf of Bathurst Regional Council;

Appendix 3: A critique of the following report:

EMM Consulting (2021) Appendix C**,** Winburndale Rivulet **- T**he Aquatic Ecology Assessment, In Premise (2021) *Environmental Assessment – Winburndale Dam Water Supply Works Approval – Amendment for Clarification of Conditions* pp 1-50.

Appendix 4: Winburndale Dam: Licence Numbers and Water Sharing Conditions, Monitoring and Recording

Appendix 5: Relevant Notes Taken from the Macquarie Bogan Unregulated and Alluvial Water Sources 4/10/ 2012 – 3/10/ 2022: Section 50 of the Water Management Act 2000

Report Abstract

The Winburndale Dam was constructed in 1933 to provide water for Bathurst City, two decades before the building of the Chifley Dam. From the dam (around 750 m elevation), the rivulet flows to its confluence with the Macquarie River (486 m), a distance of around 65 river kilometres. The rivulet mildly meanders, is a bedrock stream and drops stepwise about 5 m per kilometre, via a riffle-pool system. The prevailing instream flows pre-dam construction, were estimated by the author to be in the order of 2-4 ML per day[1] for around 80-90% of the time. Even under extreme drought conditions as occurred in the 2017-2020 drought, at least 2ML/day was entering the dam, suggesting that the author's estimates are conservative.

The distribution, abundance and conservation status of the platypus and the Rakali (native water-rat) were determined in the Winburndale Rivulet in late 2020. The methods used included a questionnaire to landholders, direct reporting by some landholders, Bathurst Regional Council's Winburndale Dam Ranger and local field naturalists, as well as access to oral histories gathered in the 1980s. Over the fifty-year period 1970 - 2020, landholder observations of platypuses decreased from being seen frequently or occasionally in the period 1970 – 2000, to occasionally or mostly never seen in the period 2016 – 2020, with no observations recorded after the break of drought period through to May 2020. The absence of platypus observations in the latter period is interpreted as possible platypus extinction within the rivulet below the dam. However, two juveniles were observed in the rivulet near Peel village in May 2020. These sightings were very likely juveniles moving upstream from the Macquarie River where large refugia pools could support limited breeding during the extensive drought. In contrast there appeared to be no instream pools suitable for platypus breeding within the Winburndale Rivulet in late 2019 due almost entirely to the low flow releases emanating from the Winburndale Dam. These release flows were in the order of 0.7 ML/day, in breach of BRC's licence conditions. Low flow impacts were also exacerbated by high summer evaporation rates. The likely reasons for the possible local extinction of the platypus population in the rivulet downstream of the dam are complex. However, the most important adverse impact was lack of instream flow.

BRC has maintained a flow deficit in the rivulet for 16 years in breach of its licence condition, in spite of a number of warnings from regulators. During droughts, flow releases averaging around 0.75 ML/day could not maintain a pool-riffle system within a 65 km rivulet, more so under hot summer conditions during an extreme drought event, when evaporation is extremely high. Landholder observations over the 50-year assessment period also indicated the gradual disappearance of the Rakali from the rivulet to near extinction by early 2020. The extended low flows, the drying up of many pools and the significant loss in volume of refugia pools are very likely directly related to the marked reduction of Rakali key prey species such as yabbies and three once common mussel species. However, it cannot be discounted that small populations of both species possibly still exist within the confines of the dam itself or upstream within the Winburndale Nature Reserve.

[1] An Olympic swimming pool contains 2.5 Mega Litres (ML) of water or 2,500,000 litres. A river flow of 1ML/day is considered a low flow. Imagine a stream section, 5m wide, 10 m long with a depth of 5cm – a flow of 1 ML/day would pass a given point every 3.5 minutes. If you were driving across a ford, water would come about halfway up the tyre (not the wheel) as it contacts the flow. Under summer drought conditions and high temperatures, instream pools are significantly depleted. Evaporation is around 6.5 litres/ m^2. Such conditions would result in a 1 ML flow not reaching much further than a few km downstream, denying riparian rights to land holders further downstream as well as adversely impacting the instream ecology.

Introduction

The Winburndale Waters Conservation Group (WWCG) commissioned Cenwest Environmental Services to develop a cost-effective methodology to determine the distribution, abundance and conservation status of two vertebrate species in the Winburndale Rivulet, namely the platypus (*Ornithorhynchus anatinus)* and the Rakali/Australian Water-rat (*Hydromys chrysogaster*). WWCG membership is made up of farming families whose properties front the Winburndale Rivulet downstream of the Winburndale Dam through to its junction with the Macquarie River. The purpose of this research was threefold:

1. Determine the distribution, abundance and conservation status of the two specie in the Winburndale Rivulet in the period 1970 - present, including the six-month period immediately following the breaking of the last extensive drought;
2. Assess the likely impacts on the two species in response to the low flow regime adopted by Bathurst Regional Council in the period 2004 – March 2020 (around 0.75 ML/day unless the dam was overtopping), with particular emphasis on potential impacts on the two species during the recent drought[2].
3. Make recommendations as to how the rivulet and encompassing catchment might be better managed as a win-win outcome for both production agriculture and the conservation of these two significant native species.

WWCG also asked Cenwest to comment on the Premise Report (2021) prepared on behalf of the Bathurst Regional Council in its quest to change the licence conditions in regard to release flows from the Winburndale Dam. WWCG also asked for comment on the freshwater assessment conducted by EMM. These assessments are provided in Appendix 2 and Appendix 3.

The Winburndale Rivulet Catchment

The Winburndale Rivulet rises east of the Winburndale Dam and west of the Sunny Corner Road. North of the Kirkconnell Correction Facility, within the Sunny Corner Sate Forest, the Mitchells and Spring Gully Creeks join to form the Winburndale Rivulet. The southern major tributary, Kirkconnell Creek rises just east of the junction of the Great Western Highway and the Sunny Corner Road, joining the Winburndale Rivulet north of the Correction Facility. A number of other tributaries join the rivulet within the Winburndale Nature Reserve and Sunny Corner State Forest. A few private properties are scattered within the State Forest and a number of market gardens are located in the vicinity of Yetholme where Kirkconnell Creek rises. The Winburndale Dam was constructed in 1933 on the Winburndale Rivulet slightly east of the location where the rivulet exits the Winburndale Escarpment. A significant tributary, the Gulf Stream, enters the eastern mid-point of the dam. It rises near the Stony Creek Trig Road. Six minor tributaries also feed into the dam, which is also believed by landholders to be fed by a range of groundwater springs.

[2] BRC has subsequently been found by NRAR to have been in breach of its licence conditions – that is it should have been releasing flows into the rivulet equivalent to inflows into the dam up to the limitations of the release pipeline. These can vary between 20-35 ML/day depending on the depth of water in the Winburndale Dam. Thus, the rivulet, downstream of the dam, has been in significant water deficit over the past 16 years, and arguably since 1933 (87 years).

Below the dam the major tributaries of the Winburndale Rivulet are St Anthony's Creek, it's confluence about 7 km downstream of the Dam, Clear Creek which joins the rivulet east of the village of Peel, and Wiagdon and Millah Murrah Creeks. There are a number of other smaller tributaries feeding into the rivulet and into the major tributaries. The distance of the rivulet from Winburndale Dam to its confluence with the Macquarie River is around 45 km in a direct line and around 65 km following the route of the main stream (Figure 1).

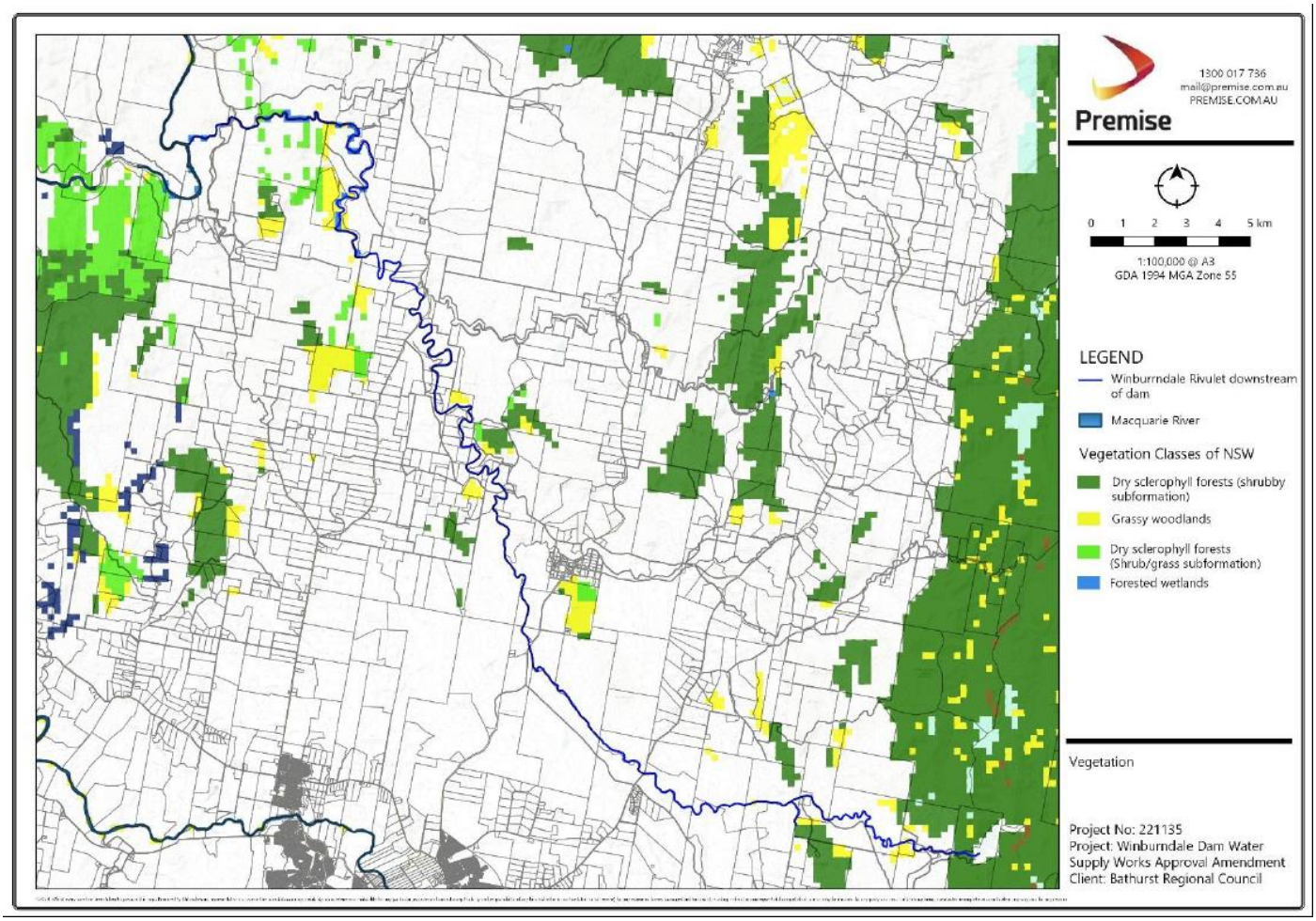


Figure 1: Winburndale Rivulet from the Dam through to the confluence with the Macquarie River (from Premise 2021)

The Winburndale Rivulet is one of the most reliable streams in the upper Macquarie River Valley. During the recent extended drought, the Gulf Stream did not run dry, nor did Kirkconnell Creek downstream of the Correctional Centre. For about 80% of the time the flow in the rivulet, in the absence of the dam, would likely have ranged between 2-4 ML/day, dropping to 1 ML/day in dry times and perhaps as low as 0.5 ML/day under some drought scenarios. However, during the last drought (2017 – 2020) inflows up to 2ML/day were occurring[3].

The rivulet, below the dam, is a classic bedrock stream, with limited meanders, dropping in elevation around 5 metres/kilometre of stream through to the confluence with the Macquarie River. The energy of flow under low conditions is controlled by a continuous sequence of

[3] [redacted]

pools and riffles, the pools occurring in river platforms, the riffles connecting pools at different elevations. Under low flows the pools are relatively still, whereas the riffles are faster flowing sections of the stream ensuring good oxygenation of pools. The complexity of the pool-riffle sequence provide specialist habitat for a range of plant and animal species. Pools and riffles are the dominant stream formation when in low flows conditions that occur around 80% of the time. Pools begin to disappear under flows greater than 4 megalitres per day and become fast flowing runs under high flows.

Since 2004 the dominant low flows when the dam is not overtopping are dependent on releases from the dam by BRC of around 0.75 ML/day, which were/are in breach of the licence conditions. Spillage over the dam is a reasonably regular occurrence. Under episodic high flow conditions, floods can act as ecological resetting events, knocking down hundreds of metres of mature River She-oaks. Under low flows, high numbers of pools of varying volumes are present, and are an essential part of the rivulet's ecology. Under drought conditions, larger refugia pools are distributed randomly along the length of the river due to being bedrock controlled. Under extreme drought conditions, post the construction of the dam, the number of refugia pools drops to around fifty, with many too small in volume, to maintain ecological integrity. The critical loss of large pool refugia under extended drought conditions is a direct result of suboptimal flow releases from the Winburndale Dam (See Figures 1-4).

Figure 1: Rivulet bed completely dry about 2 km below the dam with an exit flow of around 0.7ML/day, late mid-summer 2019. [redacted]

Figure 2: Completely dry medium pool about 2 km below the dam with an exit flow of around 0.7 ML/day, late mid-summer 2019. Volume of 'dry' pool estimated to be around 1 ML.

Figure 3: Medium pool in Rivulet in late phase of drying out, eutrophying, estimated volume around 0.7 ML, December 2019.

Figure 4: Part completely dry large refugia pool in Rivulet about 3 km downstream of dam, with a dam release around 0.7 ML/day, December 2019, estimated volume around 1.75 ML.

The teeming wildlife diversity that was likely present circa 1820 has long given way to a reduced number of species (plant, fungi, invertebrates and macro invertebrates, and vertebrate species), usually in relatively small populations. A significant number of pre-European vertebrate species are locally extinct, and a significant number of those species that remain are locally or regionally endangered, but may not necessarily be classed as endangered or threatened under the international requirements of State or Commonwealth legislation. Of particular concern is the significant decrease in insect numbers across all available ecological niches- both locally and Australian wide. This significant loss of food resources for all levels in the food chain plays out catchment wide including reduced numbers of vertebrate species that can be supported.

One geomorphic feature, the swampy meadow formation, once widespread in the catchment particularly in low flowing tributary streams with low inclines, once drove mega-productivity and helped drought proof the wider landscape. These formations are now absent but retained in the public memory by names such as Swamp Creek within the catchment. Also missing from the rivulet in 2021 is woody debris, and randomly distributed River She-oak trunks jammed at various angles across the stream, creating minor dams.

The catchment below the dam has been farmed more or less continuously since 1820, approximately 200 years. These are some of the oldest inland European farming lands in Australia. Mostly the existing farms are mixed businesses combining grazing (sheep and cattle), limited cropping with a mixture of native grasslands and improved grasslands, and are subject to a range of management strategies. The catchment is predominantly cleared of the original grassy box woodlands, dry sclerophyllous shrubby sub formations and dry sclerophyll forest with an understory of grasses, herbs and shrubs. A riparian forest dominated by *Casuarina cunninghamiana* (River She-oak) forms a more or less continuous ribbon along the riparian zone. The broad floodplains downstream of Peel were once dominated by woodland stands of *Angophora floribunda* - Rough-barked Apple. Some of these scattered large pre-European trees are still present. However, to my knowledge, no pre-European River She-oak remain.

Since 1820 there has likely been a significant decline in ecosystem resilience[4] within the Winburndale Rivulet catchment, and the major system cycles, carbon, water, nutrients have all been adversely impacted by agriculture. For example, soil carbon levels in 1815[5] were likely of the order of 4 to 6% on the valley tops and sides, and up to 8% on floodplains. The reduction in soil carbon levels across the catchment has significantly reduced soil water holding capacity. This, along with a reduction in the soil's physical and chemical fertility leads to a tendency for soil surfaces to shed water rather than allowing it to rapidly infiltrate, has also increased the rate of surface run-off, with adverse erosion impacts patchily distributed across the catchment. The loss of soil carbon has also significantly changed the pattern of water flows from landscape to side streams and the rivulet. The Winburndale Valley now tends to leak water rather than to retain it within the soil landscape. Restoration of soil carbon levels across the catchment would very likely increase production agriculture yields, soil

[4] Ecological resilience is the capacity of a damaged or impacted ecosystem to recover to its previous undamaged state.

[5] Likely soil carbon data provided by [redacted], soil scientist.

biodiversity, the health of the rivulet, the health of farm animals and increase the security of inflows to the rivulet.

Winburndale Dam

The Winburndale Dam was built in the early 1930s to augment the existing Bathurst water supply along with a wooden pipeline from the Winburndale Dam to Bathurst City. The original dam had a storage capacity of approximately 1800 ML but sedimentation has reduced its capacity to around 1700 ML. Major inflows of silt were associated with the establishment of the Sunny Corner pine plantations in the 1970s and 1980s resulting in high conservation native wet sclerophyll forest being recklessly cleared without any erosion control strategies in place.

The original licence conditions included a water release requirement for the discharge of flows into the Winburndale Rivulet not less than 8.4L/s (0.73 ML/day)[6]. The licence was renewed periodically remaining broadly consistent until 2004. Bathurst Regional Council under this license was able to extract 1,000 ML per year from the dam. Since the introduction of the 2004 licence conditions Bathurst Regional Council has interpreted such conditions to require 20% of inflow into the dam to be released to the Winburndale Rivulet as an environmental release. In contrast NRAR (Natural Resources Access Regulator) interprets the licence conditions to require 100% of inflow into the dam, up to the capacity of the 300 mm outlet pipe, whichever is the lesser, to be released to the Winburndale Rivulet when the Winburndale Dam is below capacity. The outlet pipe is capable of releasing up to 35 ML/day. Landholders would regard 4 ML/day as a minor fresh and 30 ML/day as a minor flood event or a major fresh. Bathurst Regional Council proposes to amend the wording of c ondition DK 3944 so that when the Winburndale level is below the crest level the dam would be operated to maintain a flow of approximately 0.78 ML per day adjusted for seasonal variation downstream into the Winburndale Rivulet. This proposal and the dispute between the Bathurst Regional Council and NRAR will be assessed by the NRAR in the coming months.

The Aquatic Ecology Assessment of the Winburndale Rivulet

Little was known of the aquatic ecology of the Winburndale Rivulet prior to 2020. However, the rivulet has always been regarded by scientists as particularly species-diverse and an important reference stream ([redacted] March 2021). The Aquatic Ecology Assessment prepared for Premise Australia Co Ltd in January 2021 by EMM Consulting does provide some new understandings of the rivulet's ecology. However, there is little in the way of baseline data available. Nor does EMM canvass the possibility of low flow releases since 1933 as a possible overriding impact on instream integrity. Nevertheless, EMM sought to assess the likely impacts of changing the release conditions on; water quality, volume and flow; key fish habitats; aquatic biodiversity; native plants inhabiting the riparian zone; and threatened habitats and communities downstream of the Winburndale Dam.

However, the consultants did not assess the likely impacts of 16 years of deficit flows released by BRC since 2004, in breach of licence conditions, on the ecology of the rivulet downstream of the dam. Nor did they attempt to answer the critical question – What constitutes a reasonable baseline environmental flow that would maintain the viability of top order riverine

[6] The release of 0.7 ML/day in 1933 appears not to be based on any ecological or scientific basis.

predators such as the platypus and/or the Rakali? Nor did they attempt to describe the likely ecological values of the rivulet as it might have been in 1820.

Their report suggests that impacts to the downstream aquatic environment within the Winburndale Rivulet and the Macquarie River downstream of the confluence may occur as a result of of factors including extended periods of below average rainfall or drought, the influence of agriculture, and changes to river regulation, including amendment of downstream flow volumes.

EMM acknowledge that downstream users have suggested that there has been an increased reliance on groundwater bores in the last 10 to 20 years but opined that this is not supported by available groundwater licence data. The primary potential direct impact to occur, in the opinion of EMM, is that there may be minor decreases in annual water volume and subsequent flow along the Winburndale Rivulet as a result of the proposed water supply works approval amendment. However, they do not attempt to assess the impacts of the existing low flow regimes. Bathurst Regional Council intends to utilise the full allocated licence limit of 1,000 ML per year with any impacts limited to seasonal variation. In addition, Premise argues that the proposed licence conditions replacing D K3944 have been structured to replicate natural seasonal variation in environmental flows. This and many other claims are disputed by Cenwest (See Appendix 2/3).

EMM argue that the proposed release regime will also provide variability in terms of flushing of the waterway and periodically increase water level, with flow from the Winburndale Dam currently characterised by spill events rather than planned releases. Furthermore, they argue that if the proposed NRAR approach is adopted, Winburndale Dam capacity will be low most of the time, substantially reducing the occurrence of higher-volume spills occurring and reducing the occurrence of flushing. This has the potential to remove breeding triggers for species that rely on increases in water level as a trigger to commence spawning. Furthermore, it may also reduce the opportunity for flushing of stagnant water or permanent pools that have been impacted by livestock use. These claims are also disputed by Cenwest (See Appendix 3).

EMM acknowledge that a number of impacts could potentially occur, but argue, given the proposed licence conditions are concerned only with the reallocation of water release volumes rather than the reduction of release volumes, there should be no net loss of average water release volumes from the Winburndale Dam. EMM do acknowledge that the revision of the licence conditions may result in less water being released down the Winburndale Rivulet in alignment with natural seasonal variation, although modelling indicates that any reduction to annual water release volumes will be negligible. Furthermore, they argue that it is best practice if the revised release regimes coincide with natural seasonal variation so that breeding cues in native fish species are maintained and to promote active communities of invertebrates and other biota. However, EMM understands the potential decrease in released water volume may contribute to cumulative impacts in terms of existing river regulation in the context of the alteration of seasonal flows recommended by the proposed licence condition. Cenwest disputes these assertions by EMM (See Appendix 3).

EMM make the following recommendations to ensure there are no net impacts within the Winburndale Rivulet or downstream of the confluence, following implementation of the proposed licence condition, assuming they are acceptable to NRAR.

- Specific time periods for water releases must be included within the proposed licence conditions taking into account threatened species breeding seasons as far as practicable. (*authors' note: they do not outline how this might be achieved*).
- Surface water level, flow and quality within the Winburndale Rivulet be monitored to ensure that actual values align with predicted values.
- Establish surface water level, flow and quality triggers to detect changes in salinity, toxic and/or bloom forming algae, and other parameters relevant to aquatic ecology. (*authors' note: they do not outline how this might be achieved*).
- Ensure management of water storage is undertaken so as to not exacerbate the formation of algal blooms. (*authors' note: they do not outline how this might be achieved*).
- Support the implementation of appropriate aquatic rehabilitation programs along waterway banks and within the riparian zone in conjunction with landholders and community groups, consisting of weed management, native vegetation plantings, erosion control prevention, and fencing of waterways where possible; and engaging with other stakeholders where possible to promote catchment improvement programs for waterways within the local catchment. (*Author's note: If the proposed low flow regime cannot maintain conditions to conserver two top instream predators, it is a nonsense to initiate aquatic rehabilitation programs*)
- Engage with other stakeholders where possible to promote catchment improvement programs for waterways within the local catchment.

Cenwest Environmental Services (2021) has prepared a standalone critique of the Premise (2021) report (Appendix 2), including the freshwater ecology report by EMM (Appendix 3).

The Platypus and Water-rat Questionnaire

Two methods were considered to assess the distribution and abundance of the platypus and the water-rat on the Winburndale River; intensive pool watching in early morning and late afternoons, and using a standard questionnaire. The latter was chosen for convenience as a questionnaire could be completed in about 20 minutes, from landholders' on-going observations and experience, while not taking up their time to do pool watches. The questionnaire was designed so that landholders could respond to particular questions in four-time periods; 1970-1999, 2000-2015, 2016-2019 - the period of the recent drought, and the 6-month period post the break of drought. The questionnaire was designed to assess changes in distribution and abundance over a fifty-year period. Further questions were asked regarding sightings of both species post the drought. To enable landholders to identify with a particular stretch of the rivulet, it was broken up into the following sections:

Section 1: Above the Winburndale Dam - this included the Bathurst Regional Council land around the dam itself, the Winburndale Nature Reserve, the Sunny Corner State Forest west of the Sunny Corner Road, and a few landholders with properties near the source of the Winburndale Rivulet or its upper tributaries;

Section 2: between Winburndale Dam and the confluence with St Anthony's Creek;

Section 3: between St Anthony's Creek and Clear Creek;

Section 4: between Clear Creek and Bullock's Hollow Creek;

Section 5: between Bullock's Hollow Creek and Cheshire Creek;

Section 6: between Cheshire Creek and Oakey Creek;

Section 7: between Oakey Creek and the Macquarie River;

Section 8/9: upstream and downstream of the Macquarie River adjacent to the entry of the Winburndale Rivulet.

The length of river frontages for various properties covered by this survey ranged from 1-2 km up to 15km. These continuous frontages represent about 75% of the rivulet's length through to Oakey Creek.

Returns from landholders were received for Sections 1 - Section 6, but not from section 7, between Oakey Creek and the Macquarie River. Nor did we receive any returns from the Macquarie River section (Sections 8/9) adjacent to the Winburndale Rivulet outlet.

The digital questionnaire was sent out by the executive of the Winburndale Waters Conservation group in September 2020. Nine out of a possible sixteen returns were received. Since then, two additional landholders who did not complete the questionnaire due to privacy concerns have contacted the author privately and provided additional information. Other information was obtained from a number of residents in the village of Peel (2) , and a number of landholders near the source of the Winburndale Rivulet or its tributaries in the Yetholme-Kirkconnell area (3). The current Bathurst Regional Council's Ranger who has lived near the dam for a decade was also able to provide his observations. The author also had access to oral history records dating back to 1900 from now deceased local natural historians. Landholders who responded had lived on the Winburndale Rivulet from 11-70 years. The number of returns together with the lived experiences of interested landholders ensured that the conclusions we have been able to draw from the survey are robust.

Some Baseline data

Based on my own observations and also on interviews with three now deceased regional residents in the 1970s/1980s, [redacted], there was some understanding of relevant baseline data in the period 1920 - 1960. All three men had an intimate understanding of the natural history of the Winburndale Nature Reserve and the Winburndale/Clear Creek catchments, with shared family histories extending back to the 1850s. They were all active members of the Bathurst Field Naturalists Society, now defunct. They were able to confirm:

- Prior to the construction of the Winburndale Dam in 1933, platypus sightings along the length of the Winburndale Rivulet suggested that the platypus could be regarded as common to abundant.
- It was not uncommon to see half a dozen platypuses at the same time in one large pool.
- The Winburndale Rivulet never stopped flowing in that period, even under drought conditions, although on some occasions only trickles of water joined the extensive series of pools (I have estimated the trickle flows they described at around 1 -2 ML/day).

Similarly, the Rakali was also regarded as common to abundant, as were many other wildlife species.

Appendix 1 includes a summary of the family memory of the [redacted], their market gardening properties at the headwaters of the Winburndale Rivulet, where [redacted] reflects on the changing status of the platypus and water-rat since the 1940s.

The Results

Some general observations:

The most important issues for landholders were the health of the rivulet and the maintenance of their riparian rights. The National Parks representative indicated that above the dam there were numerous pools along the rivulet and the Winburndale Nature Reserve's major tributary, the Gulf Stream. Landholders below the Winburndale Dam identified around 50 medium to large pools in Sections 2-6, that is about 2-3 medium to large pools/km of rivulet. If smaller pools were included then the number of pools per kilometre increased significantly. There was no attempt in the survey to quantify the measurements of what constituted a 'medium' or 'large' pool. Below the dam, the rivulet stopped flowing during the recent drought on a few occasions under hot summer conditions, in landholder opinion, mostly due to the failure of Bathurst Regional Council to release the appropriate environmental and riparian flows downstream. Above the dam the Winburndale did not stop flowing in some tributaries including the Gulf Stream and the Kirkconnell Creek downstream of the Correctional Centre. [redacted] using changes in dam levels was able to estimate summer flows into the dam up to 2 ML/day. If BRC had implemented the clearly stated release rules during the drought, downstream releases would have been of the order of 2 ML/day rather than the 0.75 ML/day.

Above the dam, relatively few pools dried out during the 2017-2019 drought, whereas below the dam, about 50% of the medium to large pools dried out completely. It should be noted that above the dam, river pools are generally much smaller and less frequent, than in the valley floor. The author has walked much of this section of the upper Winburndale Rivulet.

Platypuses observed in the Winburndale Rivulet, 1970-2020

Landholders were asked their recollections of platypus observations in four periods of time; 1970-1999; 2000-2015, 2016 -2019 and in 2020 post the break of drought. The results are summarised in Table 1 below.

The following generalisations can be made from the data displayed in Table 1.

1) In the period 1970-1999, 2/6 sections returned no platypus observations, four landholders occasionally observed platypuses in sections one, three and five, and one landholder observed platypuses often in section 4.
2) In the period 2000-2015 no platypuses were observed in sections 2, 5 and six, four observers reported platypuses occasionally in sections 1, 3 and 4, with no landholder reporting platypuses as being commonly observed in any section of the stream.
3) In the period 2016-2019, only two landholders reported observing platypuses in their section of the rivulet.

4) All observers reported nil observations of platypuses in the period following the cessation of the drought through to April 2021.

Table 1: Platypuses observed in the Winburndale Rivulet, 1970-2020

Rivulet Section	Responses	1970-1999			2000-2015			2016 -2019			2020 post drought		
		NO	OO	SO	NO	OO	SO	NO	OO	SO	NO	OO	SO
Section 1 above dam	1		x			x		0			0		
Section 2	1	0			0			0			0		
Section 3	2		2-x			2-x			2-x		0		
Section 4	1			xx		x		0			0		
Section 5	3	0	x		0			0			0		
Section 6	1				0			0			0		
Section 7	0												
Section 8	0												
Section 9	0												

	No returns available
	Never observed = 0
	Occasionally observed = x
	Seen often = xx

5) Five observers reported platypus present in 5/6 stream sections in the period 1970-1999; four observers reported platypus to be present in 4/6 sections of the stream in the period 2000-2015; two landholders reported platypuses present in 1/6 stream sections in the period 2016-2020; and no platypuses were observed present in the six-month period following the break of drought throughout the rivulet. These data suggest an ongoing decline of platypus numbers in the fifty-year period 1970 -2020, and the population becoming possibly extinct post the break of drought.
6) The author's knowledge of platypus numbers in the Macquarie River near the junction with the Winburndale Rivulet, is that the species is present but uncommon.

Estimated number of platypus sightings by landholders between 1970-2020

Table 2 provides an estimate of total numbers of sightings of platypuses in each period. Landholders were given the following choice categories: 0, 1-5, 6-10,11-15, 16-25 and 25-50. In the period 1970- 1999 there were 5 x (6-10) and 1x (26-50); in 2000 -2015, there were 3 x (1-5) and 1 x (11-25); in 2016 -2019 there were 2 x (1-5) estimates and 7 x 0 observations. In 2020 post the break of drought, there was one estimate of (1-5) in section 4 of the rivulet and eight zero observations. These two sightings were of juvenile platypuses[7] in the Peel Village area in September 2020 by two additional observers reporting back to the author after the completion of the Questionnaire. These data are consistent with the view of a significant decline in platypus numbers occurring in the Winburndale Rivulet between 1970 and 2020.

Table 2: Estimated number of platypus sightings by landholders between 1970-2020

[7] It is likely that these tow sightings were juvenile platypuses form a breeding event in the Macquarie River.

Rivulet Section	Responses	1970-1999	2000-2015	2016 -2019	2020 post drought
Section 1 above dam	1	6-10	11-25	0	0
Section 2	1	6-10	0	0	0
Section 3	2	6-10, 6-10	1-5, 1-5	1-5,1-5	0, 0
Section 4	1	26-50,	1-5	0	1-5,
Section 5	3	6-10, NA, 0	0, 0, 0	0, 0, 0	0, 0, 0
Section 6	1	0	0	0	0
Section 7	0				
Section 8	0				
Section 9	0				

No returns available

Additional observations by landholders and others on Rivulet Platypuses In the period 1970-2020

1) there were six observations of two or more platypuses observed together in various sections of the rivulet;
2) two platypuses were observed in the rivulet together, the remainder of the sightings were of single individuals;
3) eight platypus burrows were observed by landholders;
4) one landholder saw evidence of breeding;
5) no platypuses were observed in minor tributaries;
6) no platypuses were observed using farm dams;
7) no platypuses were observed walking across land or on farm tracks;
8) no landholder has observed a platypus being preyed on by a predator species;
9) one dead platypus was located;
10) many landholders reported that pools that were drying out during the drought, became murky and sometimes had blue-green algae present, and appeared unfit for wildlife use.
11) The first sighting of a platypus in the rivulet post drought, was in September 2020, one by a landholder and the other by a Peel resident.
12) [redacted], a Peel resident, a Wiradjuri man, and an esteemed local naturalist, and a one time resident Bathurst Regional Council Ranger at the Winburndale Dam, reported one incident of an individual platypus moving up stream from the rivulet immediately below the dam wall towards the Winburndale Dam (c 1995). This observation indicates that movement between the Winburndale Dam and the downstream rivulet is possible.

The Water-rat in the Winburndale Rivulet

The Water-rat was found to be reasonably common in the period 1970-2000, becoming less common in the periods 2000-2015, 2016-2020, with only one observed in Section 6 post the break of drought. This generalisation applies equally to populations above and below the Winburndale Dam (Table 3).

Table 3: Estimated number of water-rat sightings by landholders between 1970-2020

Rivulet Section	Responses	1970-1999	2000-2015	2016 -2019	2020 post drought
Section 1 above dam	1	0	6-10	0	0
Section 2	1	0	0	0	0
Section 3	2	1-5,0	1-5, 0	1-5, 0	0, 0
Section 4	1	6-10	1-5,	0	0
Section 5	3	6-10, 0, 0	1-5, 1-5,0	0, 0, 0	0, 0, 0
Section 6	1	NA	1-5	1-5	1-5
Section 7	0				
Section 8	0				
Section 9	0				

No returns available

Table 3 provides an estimate of total numbers of sightings of the water-rat in each period. Landholders were given the following choice categories: 0, 1-5, 6-10,11-15, 16-25 and 25-50. In the period 1970- 1999 there were 5 x 0, 2 x (6-10) and 1 x (1-5); in 2000 -2015, there were 1 x 0, 5 x (1-5) and 1 x (6-10), in 2016 -2019 there were 6 x 0, 2 x (1-5) estimates. In 2020 post the break of drought, there was one estimate of (1-5) in section 6 of the rivulet, and 7 x 0 observations. These data are consistent with the view that there has been a significant decline in water-rat numbers in the Winburndale Rivulet between 1970 and 2020, to the point of near or impending extinction post the break of drought.

Additional observations by landholders and others on rivulet Rakali in the period 1970-2020:

1) there were four observations of two or more water rats together in various sections of the rivulet;
2) the majority of the sightings were of single individuals;
3) no landholder saw evidence of breeding;
4) no Rakali were observed in minor tributaries;
5) no Rakali were observed using farm dams;
6) no landholder observed a Rakali being preyed on by a predator species;
7) no dead Rakali were located.

Discussion

The results of this research, in spite of its limitations, has determined that both the platypus and the Rakali appear now to be very limited in their occurrence within the Winburndale Valley and its associated streams and in the rivulet. It appears that the platypus in early 2020, post break of drought, was likely extinct below the dam but may still be present in or around the dam. In early 2020 post the break of drought, the water-rat was near extinction in this area. That is, we are observing in our lifetime two iconic species moving towards local extinction. This also appears to be the trend in a significant number of streams, Australia wide within the known distribution of both species. The dire straits of both species in the Central West of New South Wales is unrecognised under state legislation (i.e. neither is on the NSW Threatened Species Schedule) in law and by its citizens. Indeed, the author estimates that up

to 50% of streams, creeks and rivers in the tablelands and slopes are now devoid of both the platypus and the water-rat, and in most other streams are in very low numbers[8]. There are only a handful of streams in the eastern half of the Central Western Region, in the upper Lachlan and Macquarie catchments, where the platypus is secure and in reasonable numbers. The Winburndale Rivulet is one of dozens of tablelands streams where both species may be close to local extinction.

Post the breaking of the last extensive drought in March 2020, there were two sightings of juvenile platypuses in the vicinity of Peel. It is most likely that these had migrated upstream from refugia sites in the Macquarie River. There were Macquarie River pools large enough to sustain a platypus breeding event in August-September 2019. It is unlikely, based on the data landholders have provided, that these juveniles were from breeding events within the Winburndale Rivulet. However, while that possibility cannot be ruled out, it seems highly unlikely. Nor can it be ruled out that there remains a small population of the platypus and the Rakali within the confines of the dam.

Both species were once common species of the diverse wildlife in and associated with the rivulet in 1820. The decline of viable populations to their current status has been commented on by local natural historians, now deceased, such as [redacted]. Colonial newspaper reports, as well as accounts by earlier naturalists testify as to how common both species once were across the eastern section of the Central Western Region.

What is the current conservation status of the platypus in the Winburndale Rivulet?

The platypus is a species of conservation concern, but not yet listed under either the Commonwealth EPBC Act or the NSW Biodiversity Conservation Act as threatened (vulnerable, Endangered or critically endangered). That however is likely to change in the near future since persuasive arguments are now being put at both the Federal and State level that the platypus should be listed as a threatened species. In Victoria, it was declared as 'Vulnerable' early in 2021.

However, we can say unequivocally that the Winburndale Rivulet platypus population is locally uncommon and possibly extinct below the dam. That status is unlikely to change in the near future without addressing the major threatening processes at work within the Winburndale catchment especially the lack of appropriate flow releases from the dam. Under drought conditions, high summer temperatures and evaporation rates of around 6.5 litres/m^2, and rapidly diminishing pool volumes, and flow releases of around 0.7 ML/day cannot maintain the instream habitat integrity needed to support viable platypus and Rakali populations.

Can viable populations of platypus and Rakali be re-established in the Winburndale Rivulet?
Under the low flow regime in place since 2004, and likely from well before that, platypus and Rakali occurrence in the rivulet downstream of the dam appears to have declined, possibly resulting in local extinction of the platypus and the near extinction of the Rakali.

The two juvenile platypuses observed in the rivulet post the break of drought very likely originated from a breeding event in the Macquarie River, suggests that there is the potential

[8] This opinion is based on living in the Bathurst Region since 1972 and having many farmers report back to me as to their assessment of the local status of platypuses and Rakali on the rivers and streams that are in their farming catchments, particularly in the central tablelands.

for recruits to rebuild the population. However, the low regulated flows resulting from the Bathurst Regional Council's long term policy or their proposed continuation are likely to result in or exacerbate:

- loss of edge stream habitat;
- loss of in stream logs that provide habitat for platypus and Rakali prey species;
- significant losses in macroinvertebrate species including significant prey species such as the yabby and other crustaceans;
- an increase in the number of predator species in relation to the size of the platypus population, particularly foxes;

As well, these effects will be exacerbated by climate change, resulting in lowered rainfall, higher summer temperatures and evaporation rates, leading to depleted availability of oxygen on which macroinvertebrates depend. This effect will be accelerated by lack of oxygenation of water when riffles are reduced or dried out, with only pools remaining during low flow period. In the author's view and based on 50 years of field experience in the central tablelands, the instream flows required to maintain viable populations of the platypus and Rakali would be in the order of 2-4 ML/day at the 80-90 percentile. s.

Conclusions

BRC has maintained a flow deficit in the rivulet for 16 years in breach of its licence condition, in spite of a number of warnings from regulators. During droughts, flow releases averaging around 0.75 ML/day were unable to maintain a pool-riffle system within a 65 km rivulet in periods of low flow (See Figures 1-4), more so under hot summer conditions when evaporation was optimal. Nor could downstream landholders access their riparian entitlements. Landholder observations over the 50-year assessment period have demonstrated the gradual decline of both the platypus and the Rakali from within the rivulet to possible local extinction or near extinction by early 2020. However, it cannot be discounted that small populations of both species still exist within the confines of the dam itself or upstream within the Winburndale Nature Reserve.

Recommendations

1. The group seek to negotiate with Premise and BRC, subject to the approval of NRAR and the legal obligations imposed by the Upper Macquarie River Water Sharing Plan, increases in water flows from the Winburndale Dam that will maintain riparian rights and environmental flows, through to the junction with the Macquarie River. In periods of drought, particularly in summer conditions, when there is no measurable flow into the dam, occasional emergency releases should be allowed to occur, so that the majority of large pools are maintained along the length of the rivulet.

2. NRAR require BRC to engage a freshwater ecology consultant who can experiment with varying releases from the dam in the range of 1-10ML day, to determine optimal environmental flows to maintain instream ecological integrity.

3. Post the decision of NRAR regarding the flow release strategy, the group meet to determine further action and strategies. This would likely need to be a half day conference, with the capacity to connect with the Internet and support brief PowerPoint presentations.

4. The group seek reparations from BRC for the damage caused to the rivulet downstream of the dam, resulting from 16+ years of sub optimal flow releases from the Winburndale Dam. Such damage has seen impacts to both production agriculture and rivulet health, including the unacceptable impacts on two top river predators, the platypus and the Australian Water-rat. These sub optimal releases likely facilitated the possible local extinction or near extinction of both species downstream of the dam. Reparations might include the appropriate funding of a Landcare group, fencing along the rivulet to manage stock access to the rivulet, on-going monitoring of water quality above and below the dam, through to the junction with the Macquarie River, monitoring farm and forestry herbicide and weedicide levels in the rivulet.

5. Urge BRC to become a member of the Murray Darling Basin Association, thereby unlocking the considerable funding that is available through that body not only for councils but also for landholders.

6. Seek additional funding for farm, catchment and river restoration programmes. However, be mindful that instream river restoration cannot proceed without significant increases in flows below the Winburndale Dam.

7. The author would like to offer landholders a 4 - 5 hour tour of the Bathurst region to better understand the impacts of European agriculture on the landscapes and ecosystem function and how these can be repaired. Farming practices can change immeasurably for the better if one understands that farming is an applied ecology, rather than an applied technology.

8. Undertake as a group a full day excursion to the Mulloon Creek institute near Braidwood. There, a group of landholders are restoring the sixty or so kilometres of the Mulloon Creek, backed by significant government money, based on repairing the ecology of the creek. On the same day we would also seek to visit [redacted] property

where he has repaired swampy meadow formations, once common in the Winburndale catchment, particularly along low incline tributary streams to the Winburndale Rivulet. Swampy Meadow formations once drove mega-productivity in the Bathurst basin but have mostly been destroyed by trampling or drainage.

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Acknowledgements

I would like to thank the farming families along the Winburndale Rivulet for their help in responding to the questionnaire. Particular thanks go to [redacted] for converting the questionnaire into a digital form that could be downloaded into [redacted] provided significant amounts of information that helped bring this report to fruition. The executive of the farmer's group provided ongoing support that enabled this project to be carried out in a difficult period. I would like to thank the [redacted] for providing the information supplied in Appendix 1. [redacted] myself and [redacted] around the upper catchment of the Winburndale Rivulet west of the Sunny Corner Road to familiarise ourselves with the geography of the upper catchment. [redacted] provided many helpful observations about platypuses and water-rats in the Winburndale catchment. The late field naturalists [redacted] provided significant amounts of information re-the health of the Winburndale Rivulet, and platypus and water-rat numbers in the period 1920-1980. I would also like to thank the following ecologists for critiquing this report: [redacted] provided many helpful answers to numerous questions.

Appendix 1: information provided by the [redacted] family on platypus and water rats in the Yetholme - Sunny Corner area

Hi [redacted],

I had Dad's [redacted] responses last week and finally managed to grab Quentin on Saturday to ask specifically about platypus and water rats and here's what they told me. I couldn't find your template so I hope this information is useful but if there is a question that I've missed please let me know and I'll chase it up immediately.

Dad said they were common in his childhood (born 1942), both in the farm dam - which is the start of Kirkconnell Creek – and in creeks of the district. I asked specifically about Bob's Creek and he said yes but the activities of Forestry felling native forest and planting pines right up to the creek banks ended that. So, in effect they were able to survive cyanide, mercury and extreme sediment run-off events of the mining days but couldn't handle the ecological desertification of pine plantation! Both Dad and [redacted] said they used to see Platypus above the Windburndale Dam often. Such as at the Zephyr crossing and up to the Ford. This was all up to the 1990s. Equally, they don't spend as much time out there these days as we used to – us bushwalking, Quentin on bikes. However, Dad's wife [redacted] has a grandson who spends a lot of time gold-panning and prospecting around Sunny Corner and he hasn't reported seeing any over the last few years.

Water rats were commonly seen in the farm dams up until the 1980s and I think I actually spotted the last one to be seen on Kirkconnell farm around the year 2000. Dad thinks that regular seasonal irrigation makes it very hard for both platypus and water rats to live in farm dams because the water level changes so much quite quickly.

As a side note, while the water is always clear, I have not seen any of the little (6") black fish we used to see in the creek near the Windburndale waterfall when I was a child and I wonder about the impact of the herbicides NSW Forests use to kill everything before planting. In fact I don't see any fish in that creek now. Anyway…

So not a happy picture I'm afraid. Dad also cites the disappearance of brush tailed phascogales and a number of birds over his lifetime.

[redacted]

Appendix 2: Critique of Premise 2020 Report re Winburndale Dam and Environmental Releases (It is possible that Premise will revamp their current report extensively in response to landholder criticisms but as of 18th April 2021 have not done so).

1. Premise's central thesis is that consideration of the historical downstream releases from the Winburndale Dam since 1933, provides the basis for determining flow releases in 2021. It is important therefore to understand relevant parts of that history.

1933 licence conditions re flow releases and subsequent changes

A flow of 0.73 ML per day is to be released when the inflow is greater than 0.73 ML per day. This could be varied by the commission up to 12.27 Megalitres per day not exceeding 7 days, when the reservoir is below the crest of the dam, and not more than 20% of the increment of storage during such freshes. The specific object of the renewal in 1939 was '*Water supply for the city of Bathurst and environs and water supply to occupiers of land in the vicinity of the pipeline for* ***domestic use and stock watering'***

In 2004 a 300 mm diameter pipe fitted with a stop valve was constructed through the dam wall. This could release up to 35 ML per day when the dam is full and 20 ML per day when the dam is at 10% capacity. The current licence conditions were approved in 2012 and are described in Appendix 4.

DK3752-00001 refers to emergency releases and has only been used a few times, and landholder requests for an emergency release during the drought in 2020 was refused by NRAR.

DK3944-0001 clearly states that downstream release flows must be equal to the flow entering the storage of the dam or the capacity of the 300 mm pipe, whichever is the lesser discharge. Landholders interpret this as meaning, flows into the dam equals the release flows up to 35 ML per day. Surprisingly BRC interprets this rule as meaning they are under an obligation to release 20% of dam inflows as environmental flows.

Premise on behalf of Council is now proposing the deletion of DK 3944 and DK 3752 and the provision of downstream releases averaging 0.78 ML per day with some variability to account for seasonal variation. Downstream landholders seek to maintain the current system including the retention of DK 3752-00001 to ensure emergency releases can still be made, and object strongly to the deletion of DK 3944-0001. However, landholders are open to negotiations about what might be appropriate flows, but they must be based on science not historical flow regimes with no scientific merit.

Landholders point out that BRC has been releasing low flows of around 0.78, unless the dam is overtopping since 1933-2004, 2004 to 2012, and under the current licence conditions from 2012 through to the end of the 2017-2020 drought. Since 2012 BRC appears to have been in breach of its licence conditions and perhaps since 2004.

From the landholder's perspective this means the downstream rivulet has been in water deficit for about 87 years, unless the dam was overtopping. Under the severe recent drought conditions, particularly in the hot summer months, flows of around 0.75 ML per day resulted in downstream landholders not receiving their riparian rights, no flow in the rivulet, vanishing water holes and water holes becoming putrid, the possible extinction of platypus in the rivulet and the apparent near extinction of the Rakali (Cenwest 2021). Landholders see this as a perverse outcome since many Bathurst businesses are receiving their full quota of Winburndale

water via an inefficient pipeline, only made possible by depriving farming businesses downstream of the dam of their riparian rights as stated in the Water Sharing Plan (WSP) and almost certainly the major cause of downstream rivulet degradation. Most people would view this as a very unfair and un-Australian proposition. BRC appears unconcerned, even heartless, by the plight of business people (i.e. farmers) downstream of the dam.

The current regulations are very simple to understand in spite of Premise's and BRC's insistence that they are complex. Furthermore, BRC have been warned many times about their breach of these water conditions and have deliberately ignored these warnings, again at the expense of landholders downstream of the dam, who are also ratepayers. Salt is rubbed into the wounds in the eyes of landholders when NRAR slaps BRC over the knuckles with a warning without consequences. A 65 km rivulet downstream of the dam has been significantly degraded and two iconic Australian mammals have been pushed to the brink of local extinction, with BRC not having to provide anything in the way of reparations. If this went back to the Land and Environment Court, landholders wonder how the court might treat such wilful intransigence?

Better measurement of (1) inflows into the dam from the rivulet and the Gulf Stream and (2) downstream releases into the rivulet.

BRC continues to make the argument that it is difficult to measure inflows into the dam via the rivulet or the Gulf stream. Inflows are potentially measured using concrete rectangular trough arrangements of differing dimensions that can be housed together in the one edifice to measure both high and low flows. It is particularly important to be able to measure low flows under drought conditions.

Premise make the rather astounding claim on page 24 of their report, '*There is however no way of quantifying the actual volume of daily releases'.* Obviously, they are not up-to-date with metering that is in daily use by irrigators Australia wide with +/- 5% precision. It demonstrates a certain arrogance on the part of BRC that it is not prepared to invest in a little modern technology that might do the job they are required to do. One infers from this that if these data are logged then it is data that is highly unreliable? However, extracting that data from BRC has proved to be difficult but as of 27/3/2021 BRC has committed to providing some data.

The proposed new flow rules are based on an agency decision in 1933 devoid of scientific merit.

We have little idea as to the reasoning behind the environmental flow regime that was determined in 1933. We do know however, that this condition was set in complete ignorance of research-based contemporary river ecology and hydrology, and the manner in which, post 1980, other downstream environmental flows have been determined within the upper Murray Darling Basin. And yet Premise and BRC proudly proclaim that a whim is in no need of being informed by contemporary science. The freshwater ecologist EMM meekly give way to this ecological folly. Hence the modelling is built on a foundation without science, without argument other than historically this is the way releases have always been made. This is indeed a shaky and an unacceptable foundation on which to base modelling.

In 1986, environmental flows downstream of the Duckmaloi Weir were determined by three scientists, a water engineer and two ecologists (Public Works 1988). They determined that an environmental flow up to 6.4 ML should be released downstream before offtake could occur as part of the Fish River scheme (Lustig 1988). These flows were considered to be minimal flows to maintain a viable platypus population in the Duckmaloi River and the associated weir! The determination of this flow release was based on experimental evidence, with the downstream flow being turned off at the pipeline and then gradually turned back on again, allowing the

scientist to quantify changes in the downstream ecology under a range of flow conditions. The freshwater ecologists engaged by Premise did not appear to have the whit to understand that such an experiment could also have been carried out on the Winburndale Rivulet.

Around 2010, the flow releases below the Duckmaloi Weir were reassessed[9], and the downstream flow releases lowered to around 3 ML per day before offtake into the Fish River scheme could be initiated. This experiment took place in the upper catchment of the Macquarie River. Ironically, it was flow through the Duckmaloi River and then via the Fish River, that saved Bathurst City the embarrassment of running out of water during the recent drought. During 2019/20 Bathurst City drew its water for 62% of the time from Fish River flows rather than releasing flows from the Chifley Dam. It was science that help determined the environmental flows below the Duckmaloi Weir and not a whim of a 1933 agency devoid of ecological nous. On these grounds alone, NRAR should instruct BRC to go back to the drawing board and base their proposed modelling program on ecological criteria rather than a whim. It is also important to emphasise again, that when NRAR considers BRC's request to change the consent conditions, that a precedent already exists in the upper Macquarie River catchment as to how science can provide the foundations for determining such flows.

The Modelling Process

Cenwest has already argued that the modelling carried out by Premise is based on a whim and not on science. However robust the modelling is, and we have no cause to doubt that, if the assumptions underlying the modelling are questionable or faulty or misplaced, then little notice can or should be taken of modelling outcomes. We are also greatly hampered by the failure of Premise as of 16/4/2021, to provide satisfactory answers to the queries put to them by Cenwest. In our view it is possible that Premise has underestimated the yield available to the dam, particularly so if the data used in the modelling does not include the higher rainfall data in the upper Winburndale catchment, that is around 30% greater than on the Bathurst plains. These data could be achieved by accessing landholder long-term rainfall data in the Yetholme/Kirkconnell area. The only other option for more relevant data is from a BOM station at Clonturkle south of Yetholme. However, since it was only established around 20 years ago it would not provide the required long-term data.

It is also of great concern that Premise does not refer to or include the extensive modelling undertaken by NSW Government agency scientists when preparing the WSP. Nor is there agreement between the potential yield determined for the Winburndale Dam as background information for developing the WSP, which seems at odds with the yield determined by Premise in their 2021 EA. We are also led to believe that the flowmeter at the entry point of the Winburndale Rivulet to the dam is either not functioning or disregarded in favour of determining flows by changes in reservoir height. We have also recently been informed by Premise that evaporation data are not used in the modelling since in their view evaporation at the dam is more-or-less regarded as equivalent to rainfall. This is unlikely to be true.

Landholders have recently been provided with some limited data sets from BRC re inflows into the dam. Since these data were not previously available then presumably were not used by Premise in their modelling. If that is the case then how have such inflows been determined? Furthermore, it is crucial to landholder understanding as to what such inflows were throughout the period of the last extensive drought, 2017-2020. These data, if they do exist, independent of any modelling, are crucial in understanding the management of downstream releases, particularly during drought periods. [redacted] has calculated that during the last drought

[9] As of 26/3/20121 the author has not been able to locate the report that enabled that decision to be made.

inflows of up to 2 ML/day were not uncommon. Furthermore, landholders along the Kirkonnell Creek in the upper catchment have confirmed that this creek ran strongly throughout the last drought, as did the Gulf Stream (NPWS pers comm). This also highlights the need for working and reliable gauging stations at the entry to the dam of both rivulet and Gulf Stream inflows.

Major deficiencies in the modelling - the yield has likely been significantly underestimated for the following reasons:

I. As of the date of writing this report neither Premise nor BRC have been able to inform the community how they determined rainfall in the upper Winburndale catchment, given that this rainfall is around 30% higher than on the Bathurst Plains. The Winburndale Dam is largely replenished by upper catchment rainfall. Premise cannot just conjure up a data set. A BOM exists at Clonturkle but records only stretch back a few decades. A few local Yetholme landholders have 100 + year rainfall records but these are difficult to access and they have not been accessed.

II. Evaporation rates from the dam, unbelievably, have been discounted in the modelling.

III. Inflow rates from the rivulet into the dam have either not been consistently measured, not measured at all, and/or the existing flow device is incapable of reading low flows under 5ML/day on the grounds that this is too difficult. This is unacceptable particularly under drought conditions. There are flow meter designs that can cope with measuring both high and low flows. Locals and NPWS personnel have indicated that the rivulet above the dam never stopped flowing during the 20217-2020 drought.

IV. There is no flow meter on the Gulf Stream, the latter possibly capturing about 5-10% of the upper catchment rainfall, entering the dam on its eastern edge. This is unacceptable, particularly under low flow drought conditions. The Gulf stream did not stop flowing in the 2017-2020 drought.

The modelling shortcomings outlined above are very significant under low flow/drought conditions.

2. *Climate Change Impacts on stream flows and likelihood of supply failure*

There is not enough emphasis on the impact of climate change in the Bathurst region factored into the various scenarios modelled by Premise. Premise must be aware of the work of private and public scientists and their predictions re likely reduced long-term rainfall in the Bathurst area due to the impacts of climate change. The modelling appears to assume rainfall will not be impacted by climate change. There are a number of key reports that should have been considered by Premise (2021). These include SKM (2011) and Murray-Darling Basin Authority (2020) in which they predict a 30% reduction of annual stream flows, over the next 30 years and an 18% probability of supply failure for the Chifley Dam.

3. *Flow releases that mimic seasonal variability*

The Premise 2021 report (echoed by EMM) appears to require the dam to be full as far as is practicable in order to maintain its recommended downstream flows under BRC's preferred flow model (page 18). These are derived through overspilling and releases via the 300 mm exit pipe. Flows from this pipe are controlled by manually turning a valve. WWCG have in my view, correctly determined that the licence conditions under which BRC operate requires water to be released, with 'outflow equalling inflows' up to the capacity of the outlet pipe. The maximal release from the outlet pipe is of the order of 35 ML/day. Flows in extreme drought conditions might drop below 1 ML/day. That will depend on inflows from the Kirkconnell Creek and the Gulf stream. Both streams continued to flow at the height of the last drought with flows of up to 2 Ml/day or more coming into the dam. Both Premise(2021) and EMM (2021) appear to suggest that under

the current licence conditions there is unlikely to be the range of flows needed to trigger a range of environmental responses from various species. They further argue that this can be addressed by adopting the proposed licence conditions, where the dam brimful for much of the year, facilitates increased number of spillages.

However, under the existing licence conditions the variations in flows available are quite considerable, and can range from less than 1 ML per day through to the capacity of the outlet pipe, 20 ML when the dam is 20% full and up to 35 ML per day when the dam is brimful. Furthermore, overtopping can still occur reasonably frequently, allowing flows greater than 35 ML per day to flow down the rivulet. The range of flows that are available under the present licence conditions can therefore vary from 1-35 ML per day when the dam is not full, with much greater flows available when spillage occurs. This variability in flow regimes that are available under the current licence conditions are more than sufficient to provide the environmental cues needed to initiate a range of life history strategies across a broad range of water dependent species. It is simply not true that under the current licence conditions to infer or hint that the range of flows is insufficient to provide the range of cues needed to facilitate breeding or other life history strategies in the interdependent array of organisms located in the rivulet.

For around 80% of the time pre-1820, flow rates pre dam were likely in the order of 2-4 ML/day. Such flows could be characterised as relatively low flows. Flows in the order of 5 – 8 ML/day would be regarded by locals as a minor fresh, flows between 10 – 20 ML/day would be regarded as a major fresh, a 30 ML/day releases would be regarded as a minor flood/major fresh. When inflows into the dam are greater than 35 ML /day, the dam begins to fill. The dam would not overflow under the existing flow regimes unless the inflow was greater than 35 ML/day, and the dam was brimful. When brimful any excess water above 30ML/day would overtop the dam wall, adding to the 35 ML/day being released via the exit pipe. Under high rainfall events occurring over a number of days, flood events of varying volumes would prevail along the Winburndale Rivulet.

The scenarios described above would likely provide all the environmental cues required to induce spawning and or breeding events, where such cues are required. Such scenarios can happen under the existing flow rules and no amendments to the current licence conditions are necessary to achieve such outcomes.

However, under the low flows that have been occurring in the rivulet, arguably since 1933, with historic releases from the dam of around 0.75 ML per day, unless there are overtopping spills, these have been demonstrated by Cenwest (2021) to be flows that have led to the degradation of the rivulet and the possible extinction or near extinction of two top river predators. How then could the extension of such flow releases with minor variations, provide the necessary environmental cues for organisms that are perhaps no longer present? It makes no ecological sense whatsoever.

4. *What constitutes a reasonable baseline environmental flow downstream of the Dam wall?*

Surprisingly neither Premise (2021) nor EMM (2021) ask the question as to what constitutes a reasonable environmental flow in the context of the Winburndale Rivulet. There appears to be a fixation around the figure of 0.78 ML/day, that can be seasonally adjusted as required. This proposed flow regime appears based on what has happened historically under a regulated release scenario, rather than on well-argued ecological considerations. The report does not present data from similar stream types and catchments as a benchmark against which

comparisons might be made or to undertake assessment of ecological stream integrity along the rivulet (e.g. retention of pool-riffle sequences, maintenance of refuge pools, wetted foraging areas for aquatic wildlife species) under a range of controlled water releases from the dam.

.

The field assessment of the rivulet by EMM was undertaken over just 2 days at 6 sites along its 65 km course during, unspecified but higher than normal flows, making it impossible to comment meaningfully on stream integrity at low flows, even using such an 'expert consultant' approach. The author is an experienced platypus ecologist and stream system researcher, who is familiar with the rivulet under various flows, and suggests that in the Winburndale Rivulet the environmental flows required to maintain the integrity of that system, are likely between 2-4 ML/day for around 80% of the year. This estimate is based on the need to maintain a viable pool-riffle system, which is essential when a assessing the needs of top river carnivores such as the platypus and the Rakali.

Bathurst Regional Council has unintentionally carried out an experiment on the impact of a low release flow strategy on rivulet health over a 16 + year period. The results of that experiment have been described in Cenwest (2021) leading to the possible extinction of the platypus in the Winburndale Rivulet and the near extinction of the Rakali. Landholders have also observed the gradual decline in rivulet health over at least the past 20 years and should have been more involved in the assessment of flows deemed necessary to preserve not only the ecological integrity of the rivulet but also to provide their access to water.

5. *Riparian Rights, Environmental Flows and Irrigation Licences*

Riparian rights, environmental flows and irrigation rights are seriously downplayed by Premise (2021). Environmental flows are dealt with in the previous section. Riparian rights are not modelled and should be since they are high priority outcomes for all landholders downstream of the dam. They need to know that releases (riparian rights and environmental flows) in real time are continuing through to the junction with the Macquarie River, and have been included in the modelling. At this stage that appears not to be the case. EMM (2021) observe that a government agency report, *The Long Term Water Plan* (2019, 2020), suggests that flow volumes to maintain ecosystem functions within the rivulet is 3 ML/day (80^{th} percentile flow), measured at the confluence, and incorporates tributary inflows below the dam, but is the same order of magnitude as dam inflow!. This does not seem to square with the Premise modelling, nor have EMM or Premise taken any notice of these agency determinations preferring again historical records of the regulated condition.

Based on the *Long Term Water Plan* (2019,2020), there appear to be discrepancies between the modelling carried out by Premise and that by government agencies referred to in this plan. This needs to be sorted out rapidly. If indeed the yield of the dam is much greater than modelled by Premise (2021), then there may already be additional water up to 2 megalitres per day available for downstream delivery. Perhaps EMM have misinterpreted the long-term water plan they referred to on page 17 of their report? If they have not misinterpreted those two reports, then how can they determine that there is available water to deliver 3 ML per day at the confluence and this is equal to the inflow into the dam? Again, the significant discrepancy needs to be addressed. It is surprising that neither EMM nor Premise address that issue. After all, it was EMM, who alerted the reader to this discrepancy.

The author also notes that no modelling of the main tributary streams of the rivulet below the dam have been undertaken.

[redacted] has calculated that during the last drought inflows of up to 2 ML/day were not uncommon. It is possible that sometimes these inflows were higher.

Some property owners on the rivulet have irrigation licences but these, at least in some cases, are either not used or underutilised. Those who do take their legal share of available water, often do so by pumping from the rivulet when flows are high and storing the harvested water in existing farm dams. These rights need to be acknowledged and modelled within the report. The report should also clarify under what circumstances irrigation allocations will or will not be met.

The landholder's understanding, based on the Water Act, is that priority releases are first directed towards environmental flows, followed closely by releases to maintain riparian rights. Irrigation license allocations are less secure but nevertheless need to be taken into account. As landholders understand the situation, relevant Ministers in the New South Wales Government can put aside environmental flow rules under emergency situations, but not those flows released to meet riparian rights. Landholders also presume that water for irrigation rights are addressed and safeguarded to some extent in the appropriate Water Sharing Plan.

There appears to be some uncertainty as to whether or not the rights of a city water supply such as Winburndale Dam, override the rights of landholders as expressed in the WSP. Government needs to address this issue within the Winburndale Rivulet context. However, the water Management Act states that the order of priority is environment first, basic landholder rights second then any WAL after that.

6. *Bathurst Regional Council's Water Bookkeeping Practices in relation to the Winburndale Dam.*

In the landholder's view, inflows in to the Winburndale Dam from both the rivulet and the Gulf Stream need to be metred, the data available in real-time (or at least on a weekly basis) and transparent. We understand that the Winburndale inflows are no longer metered, or accessed, nor is there a flowmeter on the Gulf stream. Both should be metered and the data transparent and readily available to the general public as it is for the Chifley Dam.

Exit flows through the 300 mm diversion pipe and releases to the Bathurst pipeline need to be continuously metered and the data be transparent and available to landholders and/or the general public in real-time. On a monthly basis, the amount of water delivered through the pipeline to Bathurst should be available online, along with the percentage efficiency of such transfers, including the leakage occuring along the pipeline and/or at the delivery point. The overflow rates at the Jordan Creek reservoir and any flow maintained into the Hector Park artificial wetland which exists on flow diverted from the Winburndale Rivulet. This 'leakage' appears at times to be in the order of 2 ML per day. That wastage would be better directed to the rivulet downstream of the dam. This needs to be urgently addressed.

Any water diverted from the existing pipeline to landholders for irrigation or any other purpose needs to be identified and logged. The number of Bathurst businesses that depend on water from the Winburndale Dam should also be available to the general public, and how much they are able to access in any calendar year.

7. *Proposed Reparations and Other Methods to secure Bathurst's Water Supply*
   1) a case can be made out that BRC needs to fund reparations for the damage caused to the Winburndale Rivulet downstream of the dam, particularly in the period post 2004, when council has been in breach of its licence condition, and in so doing has badly damaged the

ecology of the rivulet, in addition to the stress caused to law-abiding landholders going about their daily business, caused by such inadequate flow releases;

2) Currently the Bathurst Regional Council is planning to implement an urban water harvesting plan. Such a plan makes sense in cities who do not access their water directly from a river but it makes no sense for BRC to adopt that proposed strategy. The cost to the ratepayers, albeit part funded from external sources is in the order of $9,000,000, not to mention the on-going costs of pumping and net losses due to evaporation. The solution is a common-sense solution. Bathurst already pumps water from the Macquarie River for its water supply. All that needs to happen is that the storm water that runs off the urban footprint can be modelled very easily, and then permission sought to pump this additional water from the existing Macquarie River pumping station. That would be a saving of the cost of the unneeded infrastructure. It makes sense for Orange to build an urban water harvesting scheme, since they are not located on a major inland river. For reasons outlined it makes no sense for Bathurst to do so. Perhaps those savings, if the proposed strategy suggested here is implemented, might go towards reparations as identified in 1) above.

3) Neither the state government nor BRC have a policy of including water tanks as a measure to secure Bathurst water supply. Most, if not all farmers derive most of their household water from tanks and have been doing so for hundred and fifty years or more. There are about 18,000 dwellings in Bathurst. If we assume that 50% had a tank (10,000 – 15,000 litres) and the average roof area is 250 m², and the rainfall averages 45 mm per month, over twelve months the volume collected would be around 1100ML/year. This could be doubled if every household had a tank and significantly increased again if all businesses and non-residential buildings also had tanks. Even in the middle of a drought tanks can be regularly topped up by storm showers, often rainfall that would not be captured in a water harvesting program or run off to dams. During the last extended drought Bathurst was using around 10 ML per day. Rainwater tanks could provide up to 33% of the town's water supply as well as providing a degree of resilience to water supply at zero energy cost. If Bathurst had a constructed pipeline from Chifley Dam to the filtration plant during the last drought it would have saved around about 1000ML, the volume of water that is available to Bathurst from the Winburndale Dam. There are of course zero pumping costs in collecting tank water from one's roof. The cost of putting in residential tanks would likely be less than the cost of building a pipeline between Chifley Dam and Bathurst.

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Appendix 3: Critique of EMM (2021) Winburndale Rivulet: Aquatic Ecology Assessment.

Premise engaged EMM Australia Pt Ltd (EMM) to prepare *Winburndale Rivulet Aquatic Ecology Assessment* report to determine whether the release of water, commensurate with the Council's licence condition interpretation, is likely to have a substantial impact on the aquatic ecology of the Winburndale Rivulet and downstream environments. The Council proposes to simplify the WA # 80CA723483 licence conditions by deleting condition DK3944 and condition DK3752. A new condition would replace DK3944, which proposes that when the water level in the Winburndale Dam is below its crest level, environmental flows would be released at an average annual daily release rate of 0.78 megalitres of water per day (ML/day), adjusted for seasonal variation.

EMM is effectively saying that the proposed reconfigured licence condition, if accepted would continue releases not dissimilar to those first adopted by Council in 1933, 87 years ago. On reading this the author assumed the following questions or outcomes would be addressed by EMM.

1) **EMM would therefore assess the likely impacts of long-term low flows on the rivulet's ecology**;

   EMM seems not to understand that these low flows originated in 1933 and that effectively the rivulet has been in deficit flows for nearly 90 years, and the rivulet particularly stressed under drought conditions by flows in summer around 0.78 ML per day. Self-evidently a freshwater ecologist would immediately recognise that such a low flow does not meet basic riparian rights, does not constitute a minimum environmental flow to maintain ecological integrity within the rivulet, and on very hot days when high evaporation occurs, such flows would likely only penetrate a few kilometres downstream. Rather, EMM concentrates on what would be the likely impacts of the proposed new licence condition on the rivulet if and when such flows were initiated, in comparison to the not very different previous flows that were in breach of the licence conditions. EMM does not address the central issue that the proposed change in licence conditions would deliver very similar flows that BRC has been releasing for nigh on ninety years.

2) **EMM would ask the question: What would likely constitute the lowest environmental flow that would maintain rivulet health and instream ecology?**

   There are a range of standard methodologies, together with personal experience, that would enable EMM to determine what such a flow might be, no doubt aided by Premise's modelling. One might expect that part of this determination would be the recognition of the rivulet below the dam as being a step-down pool riffle system, but there is no such recognition. They make no attempt to do so but belatedly do refer to agency work as to what constitutes an environmental flow threshold required to sustain ecosystem functions within the Macquarie catchment (p35 below section 10), and then promptly ignore this finding.

3) **EMM would rigorously examine the modelling process to determine whether it was fit for purpose, that is, did the modelling carried out by Premise, aid the freshwater ecologist to effectively address the outcomes listed here?**

   EMM accepts the modelling process, which effectively compares 1933 flows that are based on an agency decision without scientific merit, with proposed flows, and furthermore on page 15 indicate that EMM has not reviewed the water balance model

used to develop the flow series discussed and does not provide any warranty as to the accuracy of the data.

4) **Given that the attention was on assessing the continuation of historic low flows, then the necessary field work would be undertaken when the rivulet was in receipt of such low flows, i.e. between 0.40 - 1.17 ML per day.**

EMM undertook the October 2020 (7^{th} -9^{th}) field survey work, targeting six sites. There does not appear to be an assessment of river flow at that time. For the first time on page 42 we find that the survey was undertaken during inundated conditions. Table 4.5 indicates that the depth of water in sample locations varied from 0.3 – 1.2 m. The photograph of the site at W0R6, combined with stream depths at sampling sites suggests that the rivulet was flowing at a rate in excess of 10 to 12 ML per day. This is a flow which obliterates most pools and riffles. Furthermore, it did not enable the ecologisst to assess the rivulet under the very low flow conditions proposed by BRC, particularly under summer conditions.

5) **What is the basic river style of the rivulet and what were likely to be flows at the 80/90 percentile pre-the construction of the dam in 1933?**

One searches in vain for a crisp description of the Winburndale Rivulet such as: it is a bedrock stream, with a slight meander, descending about 5 m per river kilometre along its 65 km length downstream of the dam, via a riffle-pool system. The pools are usually positioned on rock platforms and the riffles join adjacent pools at different levels. This basic structure not only creates the characteristic riffle-pool system that oxygenates the rivulet, provides numerous ecological habitat niches for a range of freshwater organisms, but under medium to low flows, helps to de-energise the flow of water. The 80/90 percentile flow would likely be in the order of 2 to 4 ML per day.

It logically follows from this, that the proposed release flows are quite inadequate to maintain instream integrity and the riffle-pool system. Furthermore, given that the rivulet has been exposed to such low flows for nearly 90 years, it would be surprising if it had not degraded significantly. One might even predict that continuing this historic flow regime, but worded differently in a proposed new licence condition, might lead to further degradation of the rivulet, particularly under an extensive drought, experiencing record high temperatures, optimal evaporation rates and the conditions leading to toxic blue-green algal blooms in shrinking pools disconnected from the riffle system which would normally oxygenate the water.

Executive Summary

1. Page ES.1: In addition, the proposed release regime is considered to be the minimum release or a per day/per season basis, which would be exceeded at times in high or prolonged rainfall, and/or spill events, which is unlikely to occur if the NRAR's interpretation is applied.

I have no idea what this sentence means- there are many like it in this report.

2. The proposed release regime will also provide variability in terms of flushing of the waterway, p ES.1.

This claim is repeated ad nauseam in this report and in Premise(2021). The flow variation available under the existing licence conditions is considerable and likely to enable most if not all organisms to respond to a range of environmental cues (See point 6, p23 above in this report.)

3. Page ES.3: While ….impacts have the potential to occur, given the proposed licence condition is concerned only with the reallocation of water release volumes rather than the reduction of release volumes, there should be no net loss of average water release volume from Winburndale Dam along the Winburndale Rivulet, although it is acknowledged that a negligible decrease in total water volume may occur. However, the potential decrease in released water volume may contribute to cumulative impacts in terms of existing river regulation, in the context of the alteration of seasonality of flow within an already heavily regulated catchment, which has the potential to apply to some of the threatened habitats, ecological communities, species and populations.

   This reads like a tautology, given that the freshwater ecologists are comparing the current licence conditions, with the proposed licence conditions, where the flows are very similar, it is self-evident that there is unlikely to be any major differences re ongoing impacts. The critical question which is overlooked by EMM is: Are such low flows existing or reworded in a proposed new licence condition likely to lead to a loss in riverine integrity? The answer to that question is almost certainly yes.

4. There is an extraordinary lot of unnecessary padding in this report!

5. Page ES.3 – ***There are many examples of sentences like this which are convoluted, and difficult to understand. The important issue is the reduced flows over many years, not the difference between two very similar low flow release regimes.***

   'While the above impacts have the potential to occur, given the proposed licence condition is concerned only with the reallocation of water release volumes rather than the reduction of release volumes, there should be no net loss of average water release volume from Winburndale Dam along the Winburndale Rivulet, although it is acknowledged that a negligible decrease in total water volume may occur. However, the potential decrease in released water volume may contribute to cumulative impacts in terms of existing river regulation, in the context of the alteration of seasonality of flow within an already heavily regulated catchment, which has the potential to apply to some of the threatened habitats, ecological communities, species and populations'.

   Further down on the same page, reference is made to 'historic clearing of riparian vegetation' and 'cold water pollution'. EMM cite no evidence. These are not the Bathurst plains which were largely treeless, so there was little need for settlers to clear the River She oak, though no doubt some were felled since it was a very desirable timber, but they had access to a range of millable species such as Yellow Box and Stringybark. I presume this is an example of their misreading of the landscape, since the sections of the rivulet where there are regenerating River She - oak, is due primarily to a river resetting issue, when under high flood flows hundreds of metres of riparian forest can be ripped out overnight. As for the concept of cold-water pollution, it is not a problem with low release flows, since such flows rapidly reach ambient temperatures. Given that high flows under the way in which BRC has released water for nigh on 90

years, are confined to overtopping flows. In the Bathurst winter these can be very cold, but has nothing to do with stratification.

6. ***Page ES.4 highlights a number of recommendations. It seems a nonsense to talk about appropriate aquatic rehabilitation when the main problem is massively reduced flows that cannot support a pool-riffle system, particularly under drought conditions, where high evaporation rates and high summer temperatures further exacerbate impacts that are already occurring. As to the recommendation of ensuring management of water storage is to be undertaken so as not to exacerbate algal blooms, further evidence of EMM's inability to see the irony in such a recommendation, since it is low flows that create the conditions for blue-green algal blooms to occur in pools that are disconnected from flows****.*

   A further recommendation from EMM is:

   'While the replacement of condition DK3944 with a condition that facilitates the replication of seasonal variation in water release is supported, it is important to ensure that large amounts of water are not released immediately prior to, or during, late winter/early spring as this has the potential to provide a source of cold water pollution and/or triggering spawning late in the season. It is recommended that specific time periods for water release are included within the proposed licence conditions, taking into account threatened fish species breeding seasons as far as practicable.'

   The first sentence is false since if the flow rules had been applied as intended there is ample variation in flow. EMM, having gone along with the notion that the proposed flows under a new licence, will not differ much from the low flows provided by BRC's incorrect interpretation of what flows should have been. There appears to be very little room for large releases from the dam under the new proposals, such flows only occurring if and when the dam is overtopping.

7. Page 1 of the report: It is the Council's view that the current condition wording is overly complex and difficult to interpret. It has led to a current dispute between the Council and the Natural Resources Access Regulator (NRAR) as to the correct interpretation. Premise Australia.

   This claim is made repeatedly by EMM and Premise. The NRAR interpretation is - flow in, equals flow out up to the capacity of the outlet pipe which is 35 ML per day if the dam is full! This seems a very straightforward interpretation.

   Also on p1, this sentence occurs without explanation or comment which identifies that a government agency has done quite a lot of modelling to arrive at such figures and this modelling is not referred to by Premise:

   This original design capacity is reflected by the Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012 (Department of Primary Industries, 2012), which identifies a total allocation of 1,814 ML/year, and a 1,000 ML/year local water utility licence volume.

8. ***When describing the climate of the rivulet and their choice of deciding to carry out a survey in October 2020 under as they put it 'inundated conditions,' EMM refers to the***

BOM weather station at the Bathurst airport. They do not appreciate or understand the concept of a rain shadow effect operating from Yetholme (higher rainfall) to Bathurst (lower rainfall), nor that the flows they are describing are primarily sourced from the 30% higher rainfall zone characterised by the 'mountain climate' in the upper catchment.

9. ***EMM opine on p12 that no literature is available. The author has added at least three studies that would have been helpful to the bibliography at the end of the critique of Premise (2021). If they had approached scientists at CSU they could have been provided with more, as could no doubt the Local Land Services. Page 12 refers to water quality - in my view much more emphasis should have been given to sampling of weedicide/herbicides, given the significant area of pine plantations in the upper catchment requiring significant use of such chemicals in suppressing competing growth when re-replanting felled pine plantations.***

    The whole sampling project is problematic, since it was carried out under flows the author estimates to be around 12 ML per day, compared with the predominant low flow scenarios of less than 1 ML per day.

    I have no idea what the following sentence means:

    Sampling for vertebrate fish fauna could not be undertaken at the time of the October 2020 field survey due to the closure of the Murray Cod fishery, which encompasses all waterways, except the Copeton Dam, between 1 September and 30 November (Department of Primary Industries, 2020).

10. **P 17: under the heading of the Water Sharing Plan this statement stands out:**

    The Macquarie Castlereagh Long Term Water Plan (LTWP) (Department of Planning, Industry and Environment, 2019; 2020) describes environmental flow thresholds required to sustain ecosystem functions within the Macquarie catchment, including seasonality and frequency of events meeting certain flow thresholds, with the Winburndale Rivulet described in Part B Section 3.3 of the LTWP. The LTWP describes water dependent values relating to native fish, waterbirds, native vegetation and cultural assets……..
    The 80th percentile flow (low flow) within Winburndale Rivulet is described as 3 ML/day. This flow is measured at the downstream end of the Winburndale Rivulet, and incorporates tributary inflow from below the Winburndale Dam, but is the same order of magnitude as dam inflow…….To achieve the ecological objectives, the following management measures are recommended in the LTWP:

    • reduce the CTF periods by:
      -altering WSP rules around water take to protect baseflow;
      -consider incorporating a 'first flush' rule to provide frequent flow in the Winburndale Rivulet;
      -consider landholder extraction rostering in low flow periods; and
      -consider daily extraction limits.

    We learned from this statement that the WSP requires consideration of ecological values and indeed demands the recognition and statement of ecological objectives. EMM quote this but then go on to ignore it in their arguments. Environmental flow

thresholds are not considered by either Premise (2021) or EMM (2021). Furthermore, the WSP demands recognition of flows at the confluence of the Rivulet and the Macquarie River. This is never a consideration of either Premise or EMM when they consider flows of around 0.75 ML per day being released at the dam wall. Under hot summer conditions or even mid-winter, one can observe numerous scenarios where such a release, more so if local landholders accessed their riparian rights, might hardly penetrate 1 km down this 65 km rivulet! The WSP requirements raises serious questions about the validity of all four case modelling studies where ecological thresholds are never considered.

11. ***Much is made of the presence of the platypus in this assessment, more so since it is a top order River dependent carnivore, no attempt has been made to assess the impact of low flows on the species. That is a significant omission. That has been remedied by landholders. Under the heading key fish habitat, p30, EMM make the following statement:***

'It appears likely that areas of the Winburndale Rivulet hold surface water for prolonged periods and during dry conditions, as evidenced by its classification as having a moderate to high potential likelihood of being groundwater dependent (i.e. likely to receive baseflow from groundwater aquifers throughout the year), increasing the likelihood that the majority of the waterway could provide suitable habitat to support resident, breeding populations of threatened aquatic fauna.

If EMM had carried out their survey under summer conditions, or spoken with landholders, they would have soon understood that the previous paragraph is a nonsense. The phrase 'riffle sequence' (but not pool-riffle) is used for the first time on this page! EMM also opine that the Winburndale Dam presents a complete barrier to fish passage. Not quite - together with [redacted] we have watched a school of galaxid species swarming up the Winburndale Dam wall under conditions when water was trickling over the dam wall across the full width of the wall -marvellous to behold. Furthermore, the late [redacted] described to me fish falling from the sky in the vicinity of the dam, a well-known phenomenon when localised tornadoes can initiate such strange happening. Furthermore Cenwest (2021) present evidence that platypus are able to negotiate movement from the rivulet around the dam wall up into the dam.

12. *Impact Assessment. This section commences with the following sentence:*

'It should be noted that only impacts to the aquatic environment as a result of the proposed water supply works approval amendment have been addressed as part of the impact assessment (i.e. an assessment of the proposed changes to current management). Initial impact to the aquatic environment because of approval and issue of WA # 80CA723483 and WAL # 36892 have not been included'.

This is a classic strawman argument. We (EMM) can find very little difference between likely future impact between the previous low flows that BRC released in breach of their licence conditions and the conditions that are being proposed, and we can find very little in the way of substantial impacts. Since the two flow regimes

do not differ greatly, of course one would not expect there to be much of a difference in impacts before and after implementation.

This seems a fundamentally flawed approach since the proposed changes to rules that BRC is in breach of, have been in place since 2004 and arguably since 1933, the circumstances scream out that such low flows over such a long period should be assessed in terms of the WSP, i.e. – What are the environmental flow thresholds required to sustain ecosystem functions within the Macquarie catchment? The landholders have provided ample anecdotal evidence, and the demonstrated decline and possible local extinction of the once viable platypus population is evidence that a top river predator, was likely driven to possible local extinction by long term inadequate flows. These low flows are directly related to the release strategies from the dam by BRC in breach of its licence conditions.

Appendix 4: Licence Numbers and Water Sharing Conditions, Monitoring and Recording

WAL and Licence numbers Winburndale Dam

1. WAL = 36892

2. Water supply and water use 80CA723483
   Approval 4/10/2012
   To 3/10/2025

3. Water access licence for town water 80AL723482

Water Sharing Plan Conditions

1. **Water Take:**
   MW0655-00001 Any water supply work authorised by this approval must take water in compliance with the conditions of the access licence under which water is being taken.

2. **Water Management Works:**
   MW0491-00001 When a water supply work authorised by this approval is to be abandoned or replaced, the approval holder must contact the relevant licensor in writing to verify whether the work must be decommissioned.

3. **Monitoring and Recording**
   MW0481-00001 A logbook must be kept and maintained at the authorised work site or on the property for each water supply work authorised by this approval, unless the work is metered and fitted with a data logger.

   MW0484-00001 Before water is taken through the water supply work authorised by this approval, confirmation must be recorded in the logbook that cease to take conditions do not apply and water may be taken.

4. **Reporting**
   MW0051-00001 Once the approval holder becomes aware of a breach of any condition on this approval, the approval holder must notify the Minister as soon as practicable.

Other Conditions: Water management works and monitoring and recording

DK3752-00001

A. When the water level in the dam, authorised by this approval, is below its crest level, flows entering the storage must be released through the 300 mm valve to ensure the release of:
i. 20 % of the increment of the storage conserved in the preceding flow event, or,
ii. 50 % of the increment of the storage conserved in the preceding flow event when a drought declaration has been made by the NSW Government, or
iii. 80 % of the increment of the storage conserved in the preceding flow event when exceptional circumstances have been announced by the Commonwealth Government in response to prolonged drought.

B. Water must be released from the dam only:

i. on request from the relevant licensor, and
ii. when inflows have been recorded for not more than 28 days before the request.

NB only applies to emergency releases – only used three times over 10 years

DK3755-00001
Either:
A. a 300 mm valve must be installed and maintained in the gravitation main immediately below the dam, authorised by this approval, or
B. a pipe with a minimum diameter of 300 mm, fitted with a stop valve or other control device, must be constructed through the dam.

DK3942-00001
The crest level of the dam authorised by this approval must be fixed at Reduced Level 796.95 Metres.

DK3944-00001
The 300mm valve must be operated to maintain a flow in the watercourse downstream of the dam. The flow must be equal to the flow entering the storage of the dam or the capacity of the 300mm pipe, whichever is the lesser discharge.

DK3946-00001
A. The following information must be recorded daily:
i. total volume of releases from the dam into Winburndale Rivulet,
ii. discharge rate in the diversion pipe, and
iii. maximum water depth in the dam.

B. Records must be provided annually to, and whenever requested by, the relevant licensor, Dubbo Office.

Appendix 5: Relevant Notes Taken from the Macquarie Bogan Unregulated and Alluvial Water Sources 4/10/ 2012 – 3/10/ 2022: Section 50 of the Water Management Act 2000

- capture of ten per cent of the mean annual run-off from the property, or they are on a permanent (spring fed) first or second order stream.

1. Covered under the Macquarie River Tributary's Management zone
2. Protect basic landholder rights; p12
3. Manage these water sources to ensure equitable sharing between users: p12
4. Provide water allocation account management rules which allow sufficient flexibility in water use; p12
5. Contribute to the maintenance of water quality; p12
6. provide recognition of the connectivity between surface water and groundwater: p12
7. Contribute to the "environmental and other public benefit outcomes" identified under the "Water Access Entitlements and Planning Framework" in the *Intergovernmental Agreement on a National Water Initiative (2004); p12*
8. Bulk access Regime must take in account: p 14
   - recognises the effect of climatic variability on the availability of water as described in clause 14: p14
   - establishes rules with respect to the priorities according to which water allocations are to be adjusted as a consequence of any reduction in the availability of water due to an increase in average annual extraction against the long-term average annual extraction limit contained in Division 1 of Part 6 of this Plan: p 14
9. Part 5 Requirements for Water p17
   - This Plan recognises that basic landholder rights in these water sources and the total share components of all access licences authorised to extract water from these water sources may change during the term of this Plan.
   - Domestic and stock rights - 178 ML/year in the Winburndale Rivulet Water Source; p18[10]
   - Share component of domestic and stock access licences is 51 ML of Winburndale rivulet; p 19
   - The taking of water for domestic consumption only under a domestic and stock access licence or a domestic and stock (subcategory "domestic") access licence that existed at the commencement of this Plan, provided that the volume of water taken does not exceed 1kilolitre per house supplied by the access licence per day: p 42[11]
   - The taking of water for stock watering only under a domestic and stock access licence or a domestic and stock (subcategory "stock") access licence that existed at the commencement of this Plan, for the first five years of this Plan, provided the volume of water taken does not exceed 14 litres per hectare of grazeable area per day: p 42
   - Minister has significant powers to vary ' rights'.
   - Access licences with the cease to take conditions specified in clause 53 (16) of this plan: pp 104/ 105 identify 10 licences on the Winburndale Rivulet where cease to take rules are listed.
   - 1635 entitlement shares and 30 licences on Rivulet.

[10] Not sure what the difference is between this and the next dot point. Presume that this is the allocation below and above dam?

[11] Not sure how the amounts of water in this and the following dot point relate to annual amounts quoted earlier for riparian rights?

- Farm dams currently require an access licence when: they are located on a third order (or greater) river, irrespective of the dam capacity or purpose; they exceed the maximum harvestable right dam capacity for the property, which enables the capture of ten per cent of the mean annual run-off from the property, or they are on a permanent (spring fed) first or second order stream.

Recommended management strategies

1.Consider adding specific commence-to-pump rules in the Water Sharing Plan within five years to:

- o reduce the length of Cease to Flow (CTF) periods in Winburndale Rivulet Water Source Area.
- o better protect low flows & baseflows Winburndale Rivulet Water Source Area
- o investigate increasing commence-to-pump to 25 ML/d @ 421072 'Winburndale Rivulet at Howards Bridge' gauge

2. Consider rostering landholder water access during low flow months in Winburndale Rivulet Water Source Area.

4. Consider implementing a first flush rule to ensure CTF periods are broken at ecologically relevant times by events of sufficient magnitude to avoid adverse water quality incidents in Winburndale Rivulet Water Source Area.
   - o *This will require work to identify refuge pools, estimate the flow requirements to replenish these pools and provide sufficient dilution, and water quality monitoring to help establish and confirm these estimates.*

5. Consider implementing total &/or individual daily extraction limits (IDELS & TDELS) in Winburndale Rivulet Water Source Area.

6. Maintain existing rules in the WSP to maintain priority environmental assets

7. Ensure compliance with water access licence conditions including through metering of all licensed extraction .

8. Monitor for changes in water demand & review access rules if usage increases or if the pattern of use changes

References

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