Submission No 55

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

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Submission to the NSW MLC Inquiry into the proposed Mole River Dam

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Background

I am ecologist with more than 30 years' experience in the flora, fauna and ecosystems of north west NSW. As an ecologist I care about sustainable land management that supports the maintenance/protection of our native plant and animal populations. The importance of our native species and the ecosystems they form in the provision of ecosystem services (clean water, oxygen production, recycling of nutrients, pollination, pest control and maintenance of soil structure/fertility) appears to have been forgotten by many of our leaders. Also forgotten is that these services are essential to the on-going success of our agricultural industries and possibly more so in a changing climate.

I thank you for this opportunity to make a submission to this inquiry.

Submission

Terms of Reference

(a) the need for the projects, including the historical allocation of water and consideration of other options for ensuring water security in inland regions,

I don't believe there is a need for a dam on the Mole River. In the 1990s I worked for the then NSW Department of Land and Water Conservation (DLWC) in the Border Rivers Gwydir Catchment area. DLWC was the agency responsible for issuing water licenses and I know that in the 1990s the catchments in north west NSW were 300% over allocated. I left the department in 2006 and I would be very surprised if this situation has been remedied in the intervening years. In my experience saying 'no' is not in the culture of NSW water licensing agencies.

I believe the proposal to build these 3 dams is a knee-jerk reaction by politicians to a sustained drought, which highlighted water shortages caused by poor historic management of our Murray Darling Basin (MDB) water resources.

To my knowledge there has been little to nothing done to investigate alternatives to building a new dam on the Mole River. As a committee you should be aware that just because you build a dam doesn't make it rain more. For example, I have lived in Inverell for 40 years which is near Copeton Dam. In that 40year period Copeton has only been full 3 times, and I have seen the ecological degradation wrought by this structure.

What should really be investigated is why we persist with growing water hungry crops, using flood irrigation and large relatively shallow water storages in what is a semi-arid climate. These management practices mean that huge quantities of water are required in first place, and large

quantities are lost from the system through evaporation and leakage in the second place. Hardly best or smart practice, and even less so given predictions of declining rainfall, increasing temperatures and longer, more frequent droughts. We need to be smarter, not fall back on seriously flawed 1950s technology.

A move to more drought tolerant crops and investigation into alternative irrigation systems, recycling of tailwater and minimising losses to evaporation/leakage would be a good start in improving our water management within the Murray Darling Basin.

(b) the economic rationale and business case of each of the projects, including funding, projected revenue, and the allocation and pricing of water from the projects,

Is there an economic rationale? A feasibility study conducted for WaterNSW[1] in 2017 showed the Mole River Dam project was not financially viable. So, it must be presumed the Mole River Dam will be an on-going drain on the public purse for many years to come.

What it will do is remove a number of existing, presumably viable, farming operations within the Mole River valley, by flooding the most fertile and productive land within the valley, to provide some limited benefit to a number of downstream irrigators, with significant environmental costs. I'm an ecologist not an economist but I have to ask, what makes the downstream irrigators agricultural enterprises that have an existing water supply more important than the agricultural enterprises of the Mole River valley? Are they more important because they or associations make bigger donations to political parties?

As a taxpayer, I am angry that $24m public money is being used to develop a business case and at the same time an undisclosed amount is being used to undertake the environmental impact assessment of the proposed Mole River Dam. Money spent without any public consultation.

To me undertaking both these activities simultaneously is perverse. Surely you undertake a business case for a project and IF that is proves the project is viable, THEN you undertake the environmental impact assessment. Doing both simultaneously wreaks of corruption. It implies the construction of the Mole River Dam is a *fiat accompli,* and that in all likelihood the lack of economic viability or any detrimental environmental or cultural heritage impacts will be ignored, presumably for political purposes.

Big projects such as this should not rushed through without proper scrutiny. To do so presents a huge risk to the environment, Aboriginal culture and taxpayer pockets.

(c) the environmental, cultural, social and economic impacts of the projects, including their impact on any national or state water agreements, or international environmental obligations,

Economic impacts:

NSW signed the *National Water Initiative* (NWI) in 2004. Clause 69 *Investment in new or refurbished infrastructure states;*

[1] Jacobs (2017) *Mole River Dam Feasibility Study*
https://www.waternsw.com.au/__data/assets/pdf_file/0005/159827/Mole-River-Dam-Feasibility-Study.pdf

'The parties agree to ensure that proposals for new or refurbished infrastructure continue to be assessed as economically viable and ecologically sustainable prior to the investment occurring.'

As stated above, a 2017 WaterNSW feasibility study showed the Mole river Dam project was not financially viable, so it would appear NSW and the Federal Government are ignoring the NWI principles.

Environmental impacts:

A major shortfall in the 2020 *Ecological Constraints Assessment* for the Mole River Dam[2] is that there is no assessment of, and no indication of any future assessment into, the downstream impacts of the dam operation. The possible exceptions being of some threatened aquatic species likely to occur within 1km downstream of the dam wall, and the '*The aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River*'an endangered ecological community (also known as the Darling River EEC) listed under the *Fisheries Management Act 1994* (FM Act).

The downstream impacts of the proposed dam operation not addressed in the report include:

- changes in downstream water flows, oxygen levels and cold-water pollution affecting downstream aquatic/riparian (riverside) flora and fauna breeding and persistence.
- the trapping of sediment behind the dam wall which will alter natural sediment movement downstream; degrading in-stream habitat, altering natural nutrient pulses and increasing the risk of erosion. This is will impact aquatic species breeding cycles and the viability of riparian/floodplain plant/animal populations.
- changes in flooding and water flow regimes affecting vegetation communities dependent upon ground water and/or surface water flooding for survival and regeneration, including river red gum (*Eucalyptus camaldulensis*) communities and *Coolibah Black Box woodland* an endangered ecological community (EEC) listed under the *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Impacts that potentially threatened the health and regeneration of these species/communities also threatened the long-term survival of species such as the koala, which on the western plains depends heavily upon riparian vegetation and these tree species for shade, shelter, food and moisture.
- changes in flooding and water flow regimes affecting a number of downstream wetlands including; Boobera Lagoon, Morella Lagoon, Pungbougal Lagoon, Malgarai Lagoon, Wombyanna Lagoon, as well as many species/ecosystems dependent upon ground water, natural river flows and/or flooding for their health and persistence including again, *Coolibah Black Box Woodlands* EEC and River Red Gum communities.
- changed flooding regimes. River flooding triggers flushes of invertebrate, bacteria and plant growth on the floodplains, prompting many native aquatic species (including fish)

[2] EMM Consulting (2020) *Three Dams Project – Mole River Dam Project. Terrestrial and Aquatic Biodiversity Ecological Constraints Assessment*. Appendix B. Report prepared for WaterNSW

to breed. Flooding also facilitates movement of aquatic species between drainage systems thereby maintaining genetic diversity within the aquatic ecosystem.

Australia is a signatory to *The International Convention of Biological Diversity* and the *Ramsar Convention on Wetlands of International Importance*. These underpin the Commonwealth *Water Act 2007* and are intended to give effect to the Murray Darling Basin Plan (MDBP). The Mole River has been assessed as having high environmental diversity, and is recognised within the MDBP as being a high ecological value aquatic ecosystem. In my opinion this status is the result of it currently being unregulated.

Additionally, Australia is also a signatory to the CAMBA[3], JAMBA[4], ROKAMBA[5] and Bonn Convention[6] international agreements for the protection of migratory species and their important habitats. A number of these species comprise riparian, floodplain and/or wetland species with habitat likely to be impacted by on the dam construction and/or operation. On the dam site the ecological constraints report (EMM 2020) identifies the likely occurrence of 6 of these species and, in my professional opinion, a further 5 species listed under these agreements are likely to occur downstream including; the Great Egret, Black-eared Cuckoo, Oriental Cuckoo, Rainbow bee-eater and Common Greenshank. Construction of the Mole River Dam and the changes its operation will cause to; water flows, flooding regimes, temperature, oxygen levels, nutrient pulses, sediment movement, in-stream and floodplain habitat is likely to further degrade habitat for these species and thus is inconsistent with Australia's obligations under these agreements.

On the dam construction site and inundation area the ecological constraints study (EMM 2020) has identified 8 native vegetation communities (778.4ha) and 1 non-native vegetation community (47.4ha). The scoping study has also identified that one of the native vegetation communities comprises the critically endangered ecological community (CEEC); *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, listed under both the NSW BC Act and Commonwealth EPBC Act. The study fails to identify that a second vegetation community present, dominated by grey box (*Eucalyptus moluccana*), and areas of a third (candidate grasslands) also comprise this community, so that the estimation of 15.5ha of CEEC to be impacted by construction/inundation is potentially a significant under estimation7. The scoping study identifies a second endangered ecological community (EEC); *Semi-evergreen Vine Thicket,* listed under both BC and EPBC Acts, as occurring just outside the study area. I believe a third EEC *Carex Sedgeland* listed as endangered under NSW legislation is highly likely to be present but does not appear in the EMM report.

If the Mole River Dam project proceeds these occurrences of critically endangered/endangered ecological communities will be cleared and/or drowned by inundation and forever removed from this location. Such an outcome is not consistent with the National Recovery Plans and/or key management actions for these communities which identify loss, fragmentation and

[3] China Australia Migratory Bird Agreement
[4] Japan Australia Migratory Bird Agreement
[5] Republic of Korea Australia Migratory Bird Agreement
[6] Bonn Convention - Convention on the Conservation of Migratory Species of Wild Animals
[7] I am qualified to say this because I sat on the expert panel that determined the condition criteria for the Commonwealth listed CEEC and drafted the National Recovery Plan for this community.

degradation of habitat, and widespread pervasive factors such as impacts of climate change as on-going threats.

Key Threatening Processes:

Instream structures such as the proposed Mole River Dam are identified under the *Fisheries Management Act 1994* (FM Act)[8] as threats to the continued survival of the Darling River EEC and aquatic species due to altered flow regimes, thermal (cold water) pollution and alienation of the floodplain. All of which simplify food chains, alter natural nutrient cycles and breeding triggers for many species including endangered fish.

This is important because not only are instream and riparian (riverbank) species/communities likely to be affected by the changed flow/temperature/oxygen regimes caused by the dam, but also floodplain communities that include a number of EECs dependent on flooding regimes for their long-term viability including *Coolibah Black Box woodland* listed under both the NSW BC Act and Commonwealth EPBC Act.

In recognition of the above impacts:

- '*The installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams*' has been listed as a Key Threatening Process (KTP) under the NSW FM Act, and
- '*The alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands'* is listed as a KTP under the NSW BC Act.

The construction and operation of the proposed Mole River Dam would constitute both these KTPs identified under State and Commonwealth legislation and its construction inconsistent with this legislation.

- Additionally, the proposed dam construction/inundation/operation activities may comprise and/or will exacerbate a number of other KTPs listed under the BC, EPBC and FM Acts. These *include:*
- *Bushrock removal (BC Act)*
- *Clearing native vegetation (BC and EPBC Acts)*
- *Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758 (BC and EPBC Acts)*
- *Degradation of native riparian vegetation along New South Wales water courses(FM Act)*
- *Herbivory and environmental degradation caused by feral deer (BC and EPBC Acts)*
- *Infection of frogs by amphibian chytrid causing the disease chytridiomycosis (BC and EPBC Acts)*
- *Invasion and establishment of exotic vines and scramblers (BC Act)*

[8] https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/636498/FR22-Darling-River-EEC.pdf

- *Invasion of native plant communities by exotic perennial grasses (BC and EPBC Acts)*
- *Loss of hollow-bearing trees (BC and EPBC Acts)*
- *Predation and hybridisation by Feral Dogs, Canis lupus familiaris (BC Act)*
- *Predation by feral cats (BC and EPBC Acts)*
- *Predation by the European Red Fox (BC and EPBC Acts)*
- *Predation by the Plague Minnow (Gambusia holbrooki) (BC Act)*
- *Predation, habitat degradation, competition and disease transmission by Feral Pigs (Sus scrofa) (BC and EPBC Acts)*
- *Removal of dead wood and dead trees (BC and EPBC Acts)*
- *Removal of large woody debris from New South Wales rivers and streams (FM Act)*

Threatened species:

The ecological constraints report (EMM 2020) identifies 76 individual threatened terrestrial species (41 plants, 35 animals) that occur or are likely to occur within the construction/inundation footprint of the dam. Of these, six plant and eight animal species are identified at risk of '*serious and irreversible impact', where impacts may contribute significantly to the risk of extinction of the species* (EMM 2020).

In my professional opinion a further 36 threatened species are likely to be negatively impacted by the operation of this dam downstream comprising; 1 reptile, 1 amphibian, 13 birds, 7 mammals, 1 fish and 13 plants. The risk of extinction for these species is very high given less than 30% native vegetation/habitat remains within the downstream floodplain due to extensive and on-going clearing for agriculture and irrigation. The construction of the Mole River Dam will potentially exacerbate this habitat loss by encouraging further clearing and floodplain isolation due to larger and/or more secure water availability.

Australia is acknowledged as one of the world's most important biodiversity hotspots, with 84% of our plant species, 83% of mammals, and 45% of birds found nowhere else in the world[9]. Despite this since European settlement more than 50 species of Australian animals and over 60 species of Australian plants are known to have become extinct[9] and more than 1,800 plant and animal species are federally listed as threatened.

I believe it is irresponsible and hypocritical for Australian Governments to promote the protection of species through programs such as *Saving Our Species* (NSW)[10] and *Threatened*

[9] Australian Government https://www.environment.gov.au/biodiversity/conservation/hotspots
[10] NSW DPIE https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/saving-our-species-program

Species Strategy (Commonwealth)[11], while simultaneously promoting projects such as the Mole River Dam which will lead to:

- individual wildlife deaths, including threatened species, due to habitat clearing, excavation, inundation, cold-water pollution, changed water flows and flooding regimes
- wildlife deaths and injuries due to vehicle and machinery collisions as a result of significantly increased vehicle movements in the construction area
- increased competition within and between species. This will occur as refugee wildlife from the construction/inundation envelop move into surrounding areas of already occupied habitat, competing for depleted resources (food, shelter, mates and hollows) in the locality. Increasing aggression, the likelihood of disease and decreasing breeding success, thereby threatening the long-term survival of species' populations (including those of threatened species) in the region.
- isolation of species' populations, particularly those that use riparian vegetation and the aquatic environment for movement/dispersal within the landscape. This will lead to single populations being fragmented into two or more populations due to an inability to exchange genetic material. Species most significantly affected are fish, aquatic invertebrates, turtles, water rats, platypus, frogs and small reptiles. Plant populations are also potentially at risk of isolation, particularly where populations currently exist above and below the dam construction/inundation site and/or whose pollination vectors are dependent upon the riparian habitat for movement.
- alteration of the upstream catchment area from a free-flowing river habitat to an artificial still water reservoir habitat, leading to changes in temperature, chemical composition, dissolved oxygen levels and the physical properties of a reservoir rather than a river with its riffles and pools. This will lead to significant change in the suite of species occupying the site currently to that post dam construction/inundation.

If our currently inefficient irrigation agricultural practices need to be propped, up in light of climate change (increasing temperatures, depleted rainfall, increasing droughts and flooding) then we need to think smart and find alternatives to the old technology of dam building. Our already endangered species and biodiversity should not pay the ultimate price of extinction for our business as usual mind set.

Cultural Impacts:

It is my understanding that Australia's First Peoples are strongly connected to their country and the water resources country provides. The Native Title Report 2008[12] identifies the following indigenous cultural and customary rights and responsibilities:

- *a spiritual connection to lands, waters and natural resources associated with water places*

[11] Australian Government (undated) *Threatened Species Strategy* https://www.environment.gov.au/system/files/resources/51b0e2d4-50ae-49b5-8317-081c6afb3117/files/ts-strategy.pdf

[12] Native Title Report (2008) Chapter 6: Indigenous Peoples and Water https://humanrights.gov.au/sites/default/files/content/social_justice/nt_report/ntreport08/pdf/chap6.pdf

- *management of significant sites located along river banks, on and in the river beds, and sites and stories associated with the water and natural resources located in the rivers and their tributaries,*
- *protection of Indigenous cultural heritage and knowledge associated with water and water places*
- *access to cultural activities such as hunting and fishing, and ceremony.*

Currently unregulated, the Mole River, has been identified as a river with high environmental diversity and as such provides an important connection to the landscape prior to European settlement for Indigenous communities. If the Mole River Dam is built then this connection will be lost forever.

Downstream Boobera Lagoon (approximately 20km south west of Goondiwindi) is one of the few largely permanent wetlands within the Border Rivers section the Darling River catchment, a significant cultural site for the Bigambul and Kamilaroi people[13.] and a declared Aboriginal place under NSW law. This wetland depends on intermittent natural overland flows (flooding) to replenish its water supply and maintain its health. Construction of the Mole River Dam is likely to compromise the long-term survival of this important wetland and its cultural heritage value.

(d) the impacts of climate change on inland waterways, including future projections, and the role of dams and other mass water storage projects in ensuring security of water supply for social, economic and environmental outcomes

Increasing temperatures, changes in rainfall patterns, more extreme weather events including droughts and flooding is now impacting inland waterways, and what remains of the riverine/floodplain natural environment through decreased/changed water flows, increased evaporation and changes in ecosystems and species distributions.

Very short-sightedly (I believe) the Government just wants to continue with 1950s business as usual, by building yet another a dam without any detailed consideration of the cumulative operational impacts of the dam on an already regulated and highly stressed downstream environment. This despite the fact that in the severe and lengthy drought conditions just experienced, already regulated rivers across the MDB failed to secure the water needed to sustain the environment, inland towns or that which irrigators feel they must have. A 100-200GL dam on the Mole River is unlikely to secure significant amounts of water for downstream irrigators or towns, but it will further degrade the environment and cause irreplaceable species/habitat losses both on the construction site and in the downstream environment.

Arguments are made that river regulation will provide benefits to the environment by maintaining riparian vegetation and aquatic ecosystems through constant water flows during drought. The benefits to the environment are likely to be minimal, favour a very limited number of native species while threatening the survival of others, and consequently lead to changes in natural species/ecosystem compositions above and below the dam. Australian riverine aquatic and floodplain ecosystems are adapted to the natural wetting and drying, warming and cooling

[13] Hal Wootten, A.C. Q.C., *Report to Minister for Aboriginal Affairs re Boobera Lagoon*, April 1996.

cycles and associated nutrient pulses of these environments, and in fact depend upon these cycles for successful movement, breeding and regeneration. Flows as a result of dam releases **cannot** mimic these cycles, as can be clearly demonstrated by on-going degradation and species losses across the MDB. Further, converting a flowing river to a still, deep water storage completely changes the habitat value and the suite of species that naturally inhabit the area. So, I don't believe dam and/or mass storage units will deliver positive environmental outcomes now or in the future.

(e) water infrastructure technologies that may promote enhanced environmental outcomes,

Not building new dams or other instream structures that change water flows, trap sediments, alter flooding regimes and act as barriers to the movement/exchange of genetic material of many aquatic species, would prevent further damage/degradation of our environmental water/native vegetation assets. Removing some these structures, as is occurring elsewhere in the world (eg USA, Canada, France, Sweden, Finland, Spain, United Kingdom and Japan) would help enormously to undo the damage which has been wrought on our riverine and floodplain ecosystems since European settlement.

I'm not an engineer but using technologies to reduce evaporation within the existing regulated system would be a good start. This would include; NOT building very large relatively shallow on farm storages, NOT using open channels to supply water to off-river storages, NOT planting highly water dependent crops, NOT using flood irrigation over thousands of hectares and ensuring water license compliance to prevent water theft. By reducing losses within the system, there should in theory be more water available for irrigation and environmental flows.

(f) other relevant matters

You should note the biodiversity offset scheme currently in place for developments in Australia will NOT maintain or enhance environmental values, nor protect species from extinction. Removing one area of extant vegetation with all its habitat values in exchange for marginal gains achieved by changes in management/replanting of a second area where some habitat values may not be achieved for 100 years (ie tree hollows) is extremely problematic and unlikely to be successful in the recovery of our threaten species/ecosystems. All that happens in reality is that more areas of extant habitat are lost along with their resident suite of species, habitat fragmentation is increased and essential resources (food, shelter and breeding) depleted, resulting in increased competition and disease.

As an example, less than 5% of the *White Box Yellow Box Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands* CEEC remains across Australia. Yet the biodiversity offset scheme allows the continuing clearing of this community in exchange for dubious management/protection/replanting of other areas which may or may not be, or have previously supported, this CEEC. If Australian Governments were serious about recovering this CEEC then no more clearing of the CEEC would be permitted, and management/protection/replanting of other areas would be more actively encouraged.